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A.S.C. MAGAZINE

Buck Jones

July 1931

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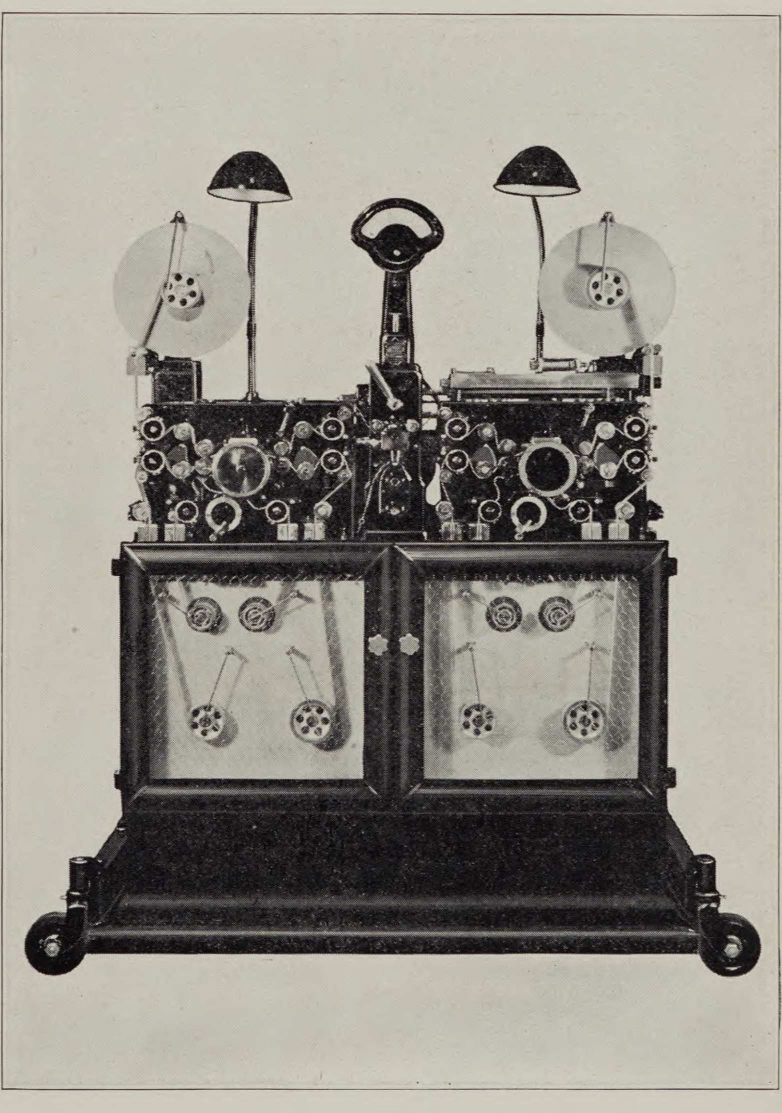

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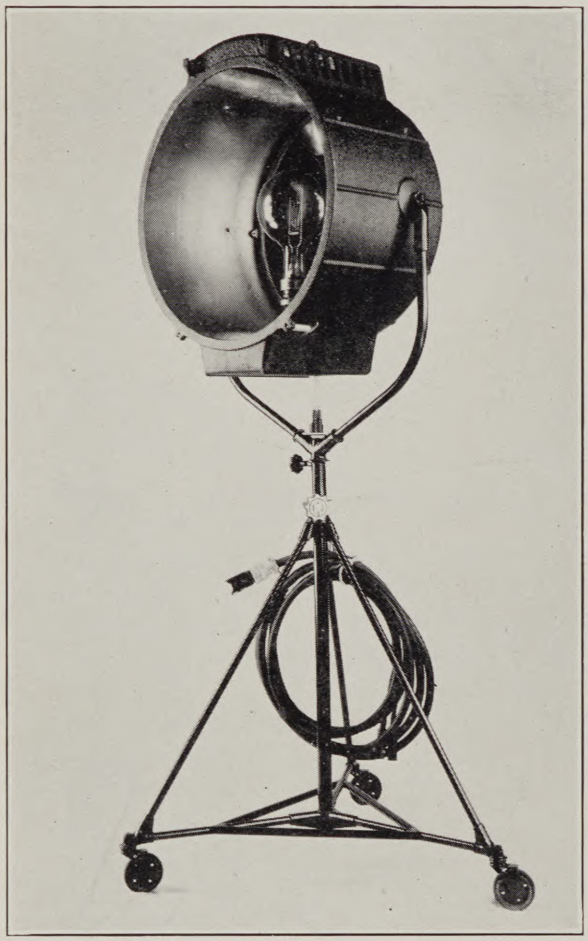

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A Technical and Educational Publication, Espousing Progress and Art in Motion Picture Photography

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(Signed) Frank P. Arrousez,
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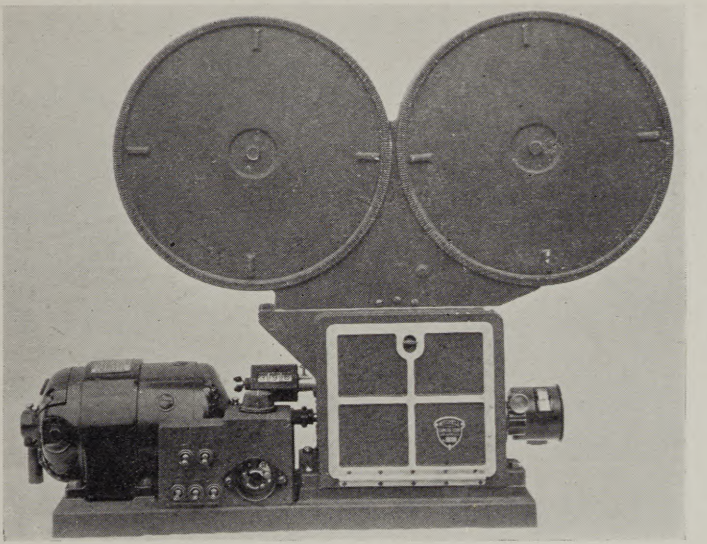

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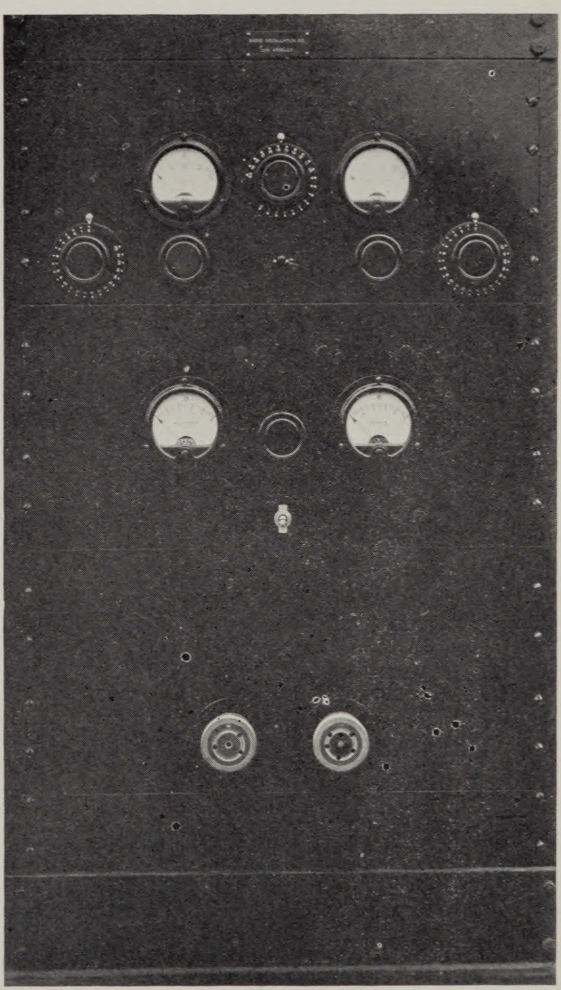
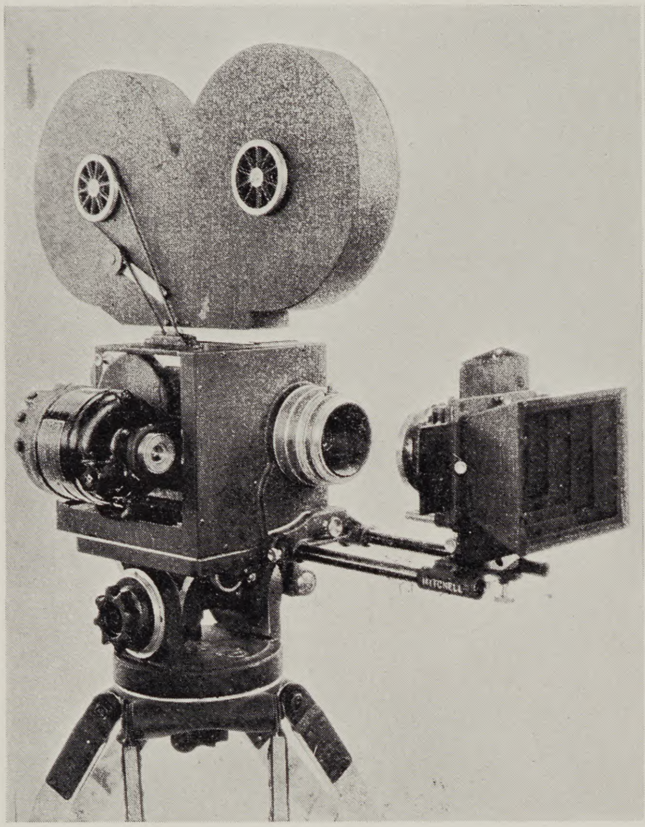
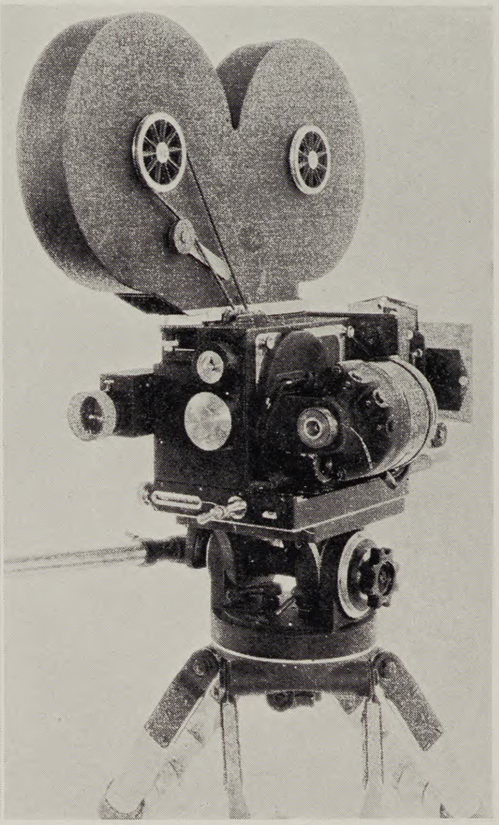
(Below, Front View of Amplifier)



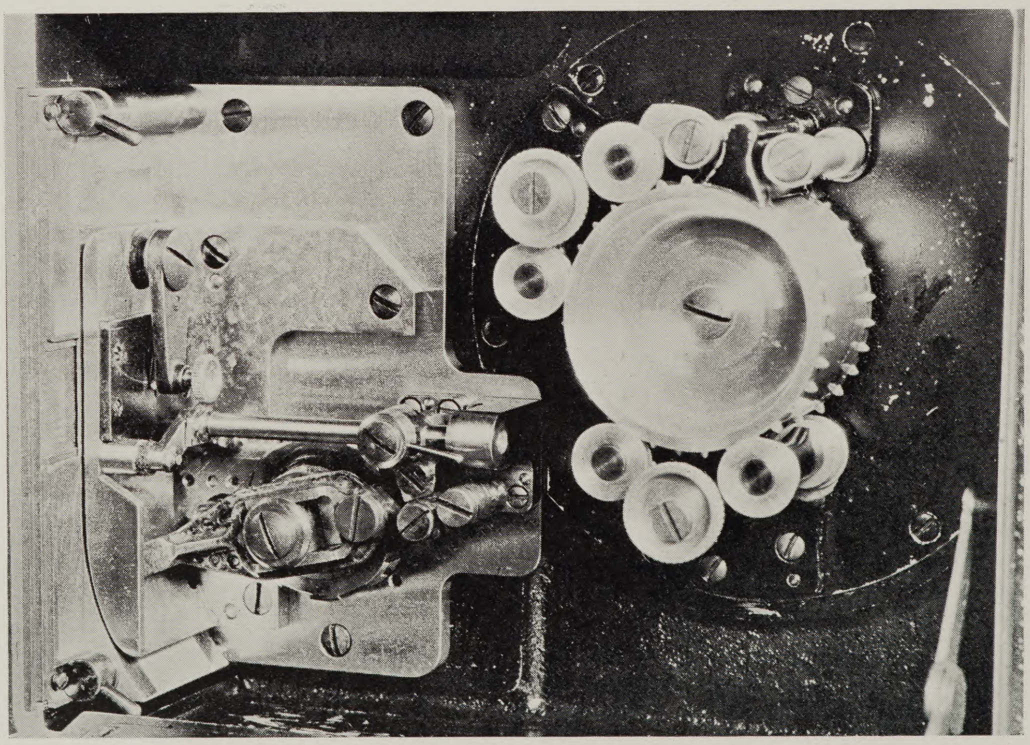
The New Silent Mitchell



Front View



Back View



The Camera Movement

The Silent Mitchell Camera

by **WILLIAM STULL, A. S. C.**

BEFORE the days of talking pictures, no one gave a thought to the slight noise made by the professional camera. It was merely the well-bred purr of perfectly designed machinery, unimportant save as distinguished from the clatter of cheaply made apparatus. But with the coming of the microphone, this hitherto insignificant hum took on a new aspect: it was a symbol of the fetters with which the new element of sound was binding the highly developed Art of cinematographic story-telling. As such, as well as for more practical considerations, it must be overcome. As long as the cameras were fettered by booths, blimps, and such silencing devices, neither cameraman, director, nor recordist could enjoy either the technical or artistic freedom necessary to the production of perfect pictures.

Logically, the first step toward this goal was the remodeling of existing apparatus to a point where its noise was reduced to the minimum. But this improvement, though considerable, was only a makeshift, and was recognized as such. No amount of alteration could take all the noise out of an inherently noisy mechanism. The best that could be hoped for was a temporary improvement of existing conditions. Real progress must come through a completely new design.

So it is only now, after several years of experimentation and research, that the truly silent cameras are beginning to appear. The first of these was demonstrated at a recent meeting of the American Society of Cinematographers by Mr. George Mitchell, its designer, and his associates of the Mitchell Camera Company.

The new camera is, in outward appearance, not greatly different from its predecessors of the Mitchell line; family resemblances are not confined alone to animate beings. Anyone who is familiar with professional cinema cameras will at once recognize the new camera as a Mitchell. It retains the same general form, and the same general arrangement of its essential units and its accessories. But—it is nevertheless expressly designed for talking picture use. And it is quiet. Not so perfectly noiseless, perhaps, as to be perfect to the jaundiced eye of the most exacting recordist, but indisputably the nearest thing to such perfect silence that has yet appeared.

This silence is secured through two chief factors. First, simplification of the mechanism; and, Second, insulation of the camera box, so that what noise there is does not leave the camera.

The movement is simplified to an almost unbelievable degree. There are but two pairs of gears in the camera! One of these drives the intermittent movement from the main-shaft, and the other drives the shutter-shaft. The movement itself, though of much the same type as the previous Mitchell speed movement, is vastly simplified, and is actuated by eccentrics rather than by gears and cams. The film-moving claws move into and out of the perforations much straighter than before, reducing the strain on the film, and leave the film at rest for a somewhat greater period. The dissolving shutter has been eliminated, as it is no longer needed in studio practice. The angular aperture of the shutter is adjustable from the rear, when the camera is not in operation, and is fitted with a positive lock. Two types of shutter are offered: one in which the opening may be varied from 175 degrees to 0 degrees, and one in which the minimum opening is only 30 degrees, but the maximum is 210 degrees. The shutter is placed far closer to the film than ever before.

The camera case throughout is insulated with a layer of cork placed between the inner and outer walls of the case. The magazines are similarly insulated, and camera and magazines are likewise insulated from each other, there being no metallic contact between the two. It has been determined also that camera and tripod head be similarly insulated, for, although in the tests made by the company, in nine cases out of ten this was shown to be unnecessary, it is realized that no such series of tests can parallel the conditions of every camera set-up, and, accordingly, insulation of the tripods was adopted as the safest policy for general practice.

The greatest stumbling-block thus far has been the securing of adequately quiet driving-motors. The motors commonly used with the various sound systems, not having been designed for use without silencing devices, such as blimps or blankets, are far from silent. In addition, most of them operate through a reduction gearing. The Mitchell Company, however, have secured special synchronous motors for this use, which are adequately, if not perfectly, silent. These motors, however, necessitate the use of a frequency-changer, as they operate on 48-cycle Alternating Current, instead of 50 cycle. Satisfactory silent motors can, however, easily be developed, and it is to be hoped that the firms leasing the sound equipment used in the major studios will shortly provide more suitable motors, so that the fullest advantage may be taken of this new camera. Until such motors are developed, however, the Mitchell engineers are experimenting with various methods of insulating the present motors, which though a makeshift, should prove adequate until really satisfactory new motors are available.

In addition to their silent operation, the new cameras include several features which alone are of considerable advantage. Most important of these is the new type of lens-mount and focusing mechanism. Under the present conditions, multiple-lens turrets are no longer necessary. Therefore, the camera has no turret: instead the lens is placed in a large, standardized slip-mount, which is capable of accommodating any lens used in modern production. The lens is locked in place by a set-screw, and focusing is done from the rear of the camera by means of a large, milled knob, placed at the lower left-hand corner of the camera-base. **The lens is so mounted that it does not rotate in focusing.** As will be seen in the illustrations, there is a slit at the rear of the camera through which the engraved focusing scale on the driving screw is visible. These scales are removable, and interchangeable. Therefore a separate quill may be had for each lens used, making for absolute accuracy in following-focus with all lenses at all times. A special fitting is made for the matte box, permitting it to be fitted tightly against the fronts of these standard mounts, and excluding all light from this source.

In speaking of his camera, Mr. Mitchell says, "We feel that it is a distinct improvement in many lines, but particularly in the matter of quieter operation. None the less, we do not claim that it is an absolutely noiseless camera. Such cameras will probably come, though they are far from being developments of the immediate future. For the present, however, we feel certain that this new camera of ours will fill a definite place in the industry, for not only is it a very appreciable advance toward the goal of perfectly silent operation, but it is the first camera that has been designed and built specifically for talking picture use, and developed with the benefit of years of intimate, personal experience with the problems of sound-film photography. Therefore, we were very proud to be able to present this camera before the members of the American Society of Cinematographers, whose daily problems and en-

(Continued on Page 22)

Fast Improvements of Fast Film

Some Pertinent Comments from a Practical Cinematographer

by **CHARLES G. CLARKE, A. S. C.**

SINCE the recent introduction of "Fast Film," cameramen of all studios have been making tests and have been photographing regular productions with it. Much has been written and said of its over-all sensitivity, its better color rendition, ease of lighting, less amount of equipment required, and better temperature conditions of the set. In another part of this magazine will be found the endorsement and recommendation of this Society for the general use of this type of film, setting forth reasons for this action. What, then, were some of the problems confronting the cinematographer in adjusting himself to this new medium?

Having recently completed a Fox picture photographed throughout on fast film, I may mention some of the advantages I found that have not been mentioned in papers that have appeared before. The production referred to is "Annabelle's Affairs," featuring Jeanette MacDonald and Victor McLaglen. The breezy, light comedy mood of the picture called for bright, sparkling photography. Its high speed action required that the camera be flexible and mobile to follow the actors wherever they might be, so that intimate bits of business could be put over without the excessive use of close-ups. With this plan of procedure in mind, a balance of light was established which, thanks to the increased sensitivity of the new film, did not greatly exceed that used to illuminate well lighted rooms.

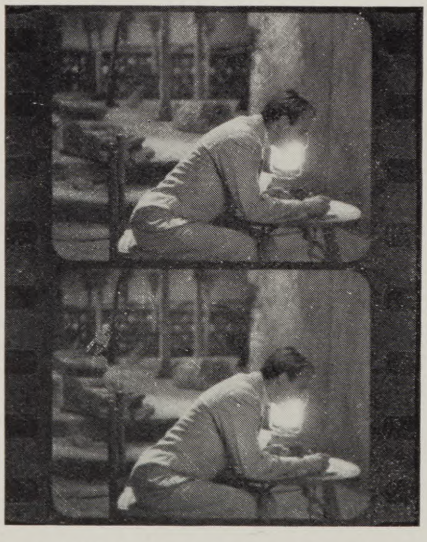
One might presume that if the new film were twice as fast as the old, the amount of lighting units need only be cut in half, and the results would be the same. When this method was tried, however, other serious problems arose quite apart from purely those of light balance. Shadows of the microphone were cast on the walls of the set and were very apparent as the microphone and support were moved to follow the action about the set. "Leaklight" or "Spill-light" was also now troublesome and was caused by the uneven distribution of the few lights used, they being so localized as to make an even balance of light impossible.

The next step was to use enough of the existing lights to give an uniform distribution of light over the sets, then reduce their intensity by diffusing mediums which further spread out the light. This method also remedied the problem of microphone shadows, because the multiplicity of lights had the effect of counteracting the shadows produced by each other. The dominant source of light was placed in such a way that any shadows fell out of the range of the scene. I found the supersensitive film further advantageous because the volume of light required for exposure was so low that the light fixtures used in the sets appeared in their true relation of brightness, and, in some cases, became the true source of light.

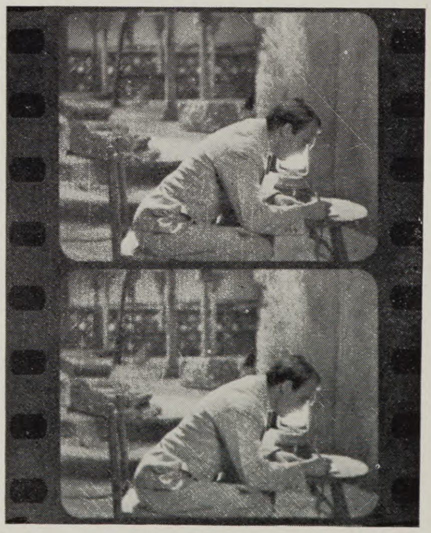
Many of our scenes are photographed from moving vehicles so as to be able to photograph the actors as they move about in close proximity and from the most advantagous angles. The lighting of these scenes is always a difficult problem, particularly because the lights are a great distance away, and not always can they be placed at the best positions for beautiful lighting of the stars. The ever dangling microphone just over their heads further complicates matters, so that heretofore large, bulky lamps had to be carried with the camera to off-set the uncomplimentary shadows caused by the overhead lamps. The new film has made the use of smaller lamps possible, and this greatly facilitates the technic of lighting.

The color sensitivity of the new film has been improved so as to render colors more nearly in the values as seen by the eye. It is a little over-corrected to the red ray region when used with incandescent lights, particularly if these lights are not burned up to their rated voltage, as is often the case. This line drop of voltage is much more detrimental when incandescent lights are used, and the Electrical Department must supply the correct voltage for the rated voltage of the lamps, or the full efficiency of the new film is lost and the quality of photography is below standard. I have found that for render-

(Continued on Page 40)



Photographed on regular fast film without gray base.



Photographed on anti-Halation film.

Photographic Lens Tests

by **DR. W. B. RAYTON**

IT IS possibly no more difficult to design a photographic objective than it is to determine completely and accurately the value of the result. It seems obvious that since photographic lenses are designed as instruments for photography it should be a simple matter to take a picture with a lens and thus learn completely and almost without effort all about the ability of that lens to make a picture. This seems reasonable until the process is analyzed whereupon the photograph will be discovered to be not only a test of the lens but also something of a test of the camera, of the photographic emulsion, and of the technique of the photographer and the laboratory man. Since most people fail to derive much mental satisfaction from the contemplation of a negative, the process usually involves making a print also and in motion picture practice this positive print is projected on a screen entailing another series of variable factors all of which affect the degree of excellence of the final result.

There is another way in which lenses may be tested. By means of equipment known generally as a lens bench the magnitude of the residual aberrations in a lens can be measured. The information given by the lens bench is useful to the lens designer and it permits some attempt at quantitative specification of performance but it is practically impossible for the imagination to transform lens bench measurements into a mental picture of the quality of the image the lens can form. Lens bench tests can prove whether two lenses are alike or not. If they appear alike in every respect they will undoubtedly perform alike in practice under the same conditions but if they are recognizably unlike in the lens bench tests it is generally impossible to determine what effect the recognized differences will have on the image quality of the lens without resorting to photographic tests.

The situation, therefore, is not all that could be desired even by one who has occasion to make comparative tests of lenses for his own information only and it is much more difficult for any agency such as a testing laboratory, for example, to find means for accurately and completely determining and expressing lens performance.

In the testing of any commodity there is apt to be a slight degree of suspicion on the part of the practical man concerning laboratory methods, a suspicion which like all others is founded on ignorance. It is manifested by the farmer in connection with the Department of Agriculture's tests of agricultural products and by the manufacturer in connection with Bureau of Standards' tests. The so-called practical methods of test are "practical" sometimes because they are more rapid but sometimes, unfortunately, only because they are familiar. Laboratory methods are characterized by an effort to exclude extraneous influences to the end that only that quality of the commodity is tested concerning which information is desired.

In the realm of lens testing we might regard the making of actual pictures as the practical method and the lens bench examination as the laboratory method of testing. Objections to each have been suggested above. There is a method of procedure, however, that avoids to a high degree the misleading results obtainable by the ordinary photographic practice and at the same time escapes the uncertainties of interpretation encountered in considering the results of lens bench measurements. This method, although it may be considered a laboratory method, is a photographic one, but taking advantage of the conjugate relation between object and image planes, the photographs are taken in the plane ordinarily occupied by the object while the test object occupies the plane of the ordinary image.

Figure 1 shows in a schematic way the arrangement we have used. At the left is a source of light which may be an ordinary incandescent lamp or any other source desired. A condenser lens is employed to concentrate some of the light from the source into a reasonably parallel or converging beam. It is not important whether it be parallel or converging and in fact it is more of a convenience than a necessity for it is followed by a sheet of ground or "opal" glass to diffuse the light and to insure that the full aperture of the lens under test is employed. Immediately following the ground glass is a metal plate with a hole bored in it, mounted on a carriage which permits transverse movement measurable with a scale. For this arrangement a single plate with several holes in it can be substituted. If the spacing of these holes is chosen wisely no shift of the plate would be necessary and the test somewhat facilitated. The lens under test must be mounted perpendicular to the test plate and adjusted for focus until the hole in the test plate is imaged at the chosen distance on the image plane, the film plane shown at the right of the drawing. In this arrangement the photographic lens functions like an ordinary projection lens with the single but important difference that a plate of diffusing material is used between light source and object in order to avoid the danger of drawing false conclusions due to an incompletely filled lens aperture. This necessary condition has often been neglected in similar tests in the past and it cannot be too strongly emphasized here.

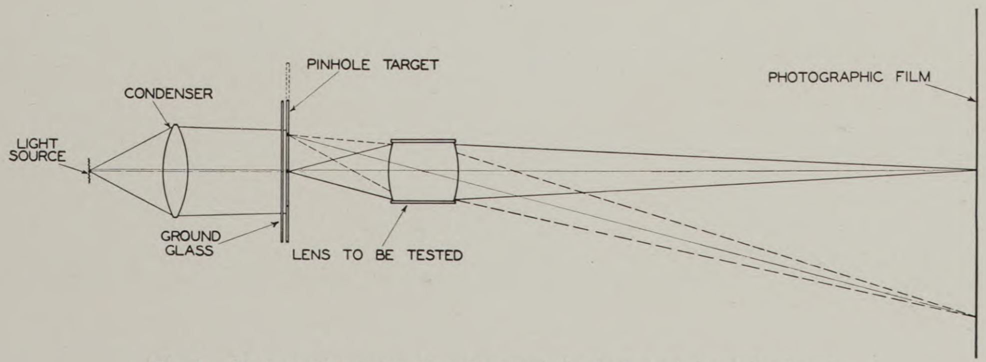


Fig. 1. Diagram of a proposed arrangement for testing photographic lenses.

With this arrangement completed the test is conducted by taking separate and consecutive photographs of the hole in the test plate, setting it first on the axis of the lens and subsequently moving it at right angles to the axis in steps of any desired amount until a distance has been reached equal to half the length of the diagonal of the picture the lens is required to cover. After the focusing has been perfected with the hole in the center of the field the focus adjustment is not touched during the complete test. In the case of motion pictures the length of the diagonal is 28.65 mm. In carrying out the test the time of exposure will have to be increased as the hole is moved farther from the central position for reasons connected with the construction of the lens to some extent, with the character of the performance of the lens and, more than anything else, with the character of the illumination. The difference in time of exposure thus observed is of practically no significance in reaching conclusions as to the performance of the lens. It should be self-evident that the image of the hole in the test plate will travel transversly as the test plate is moved going in the opposite direction and by an amount equal to the shift of the test plate multiplied by the magnification of the lens. This requires, therefore, that means be provided for moving the plate or film holder in a plane exactly perpendicular to the lens axis in order to make the various exposures.

The advantage of this test lies in the fact that all the aberrations of the lens manifest themselves on such a magnified scale that their effects are very large in comparison with the size of the grain of any photographic emulsion. If we choose a projection distance equal to a hundred and one times the focal length of the lens measuring from the front of the lens the magnification will be one hundred times. Interchanging object and image, that is reverting to the usual order, the reduction would be one hundred times or the magnification would be 1/100 X. The ratio between the two magnifications will be 10,000. The effect of residual aberration will therefore be many times as great (but not 10,000 times) in the proposed procedure as in the ordinary use of the lens.

Any kind of photographic material desired may be used and the color of the light may be made anything from blue to red by means of suitable filters placed between the light source and the test plate.

The chart reproduced herewith, Fig. 2, shows the results of a test carried out in this manner with a 50 mm Raytar lens at full aperture (f:2.3) together with tests of four other well known types of lenses of the same focal length and approximately the same relative aperture. Differences in lens performance are detectable in the original prints with an ease and certainty unapproachable by the ordinary method. It is a question, however, how much detail will remain in the halftone reproduction.

The test permits an interesting study of the effect of emulsion grain on the sharpness of the picture. The two circles reproduced in Fig. 3 tell the story. Of these two circles A was produced by a 50 mm Raytar at full aperture and is in fact the center shot of lens 4 in Fig. 2. Circle B was obtained in the following manner: A circular disc of white paper of the same diameter as circle A was mounted on a black background and stationed at the place where the photograph A was taken. In the place occupied by the test plate when A was taken a piece of panchromatic motion picture negative was located. The lens was stopped down until no spherical aberration could be detected and chromatic aberration was eliminated by means of a filter. Exposures were made of several different lengths and the best negative selected from the group. This was then printed on motion picture positive by contact printing. We now had a test plate that consisted of motion picture positive with a transparent spot in it whose diameter should have been exactly equal to the diameter of the hole in the test plate from which circle A was made. This positive print was substituted for the test plate, projected and photographed exactly in the same manner as before except that the lens aperture was reduced and a filter used to eliminate aberrations. The difference in sharpness of outline in the two circles is principally the result of emulsion grain.

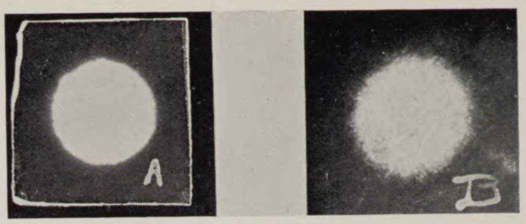


Fig. 3
Shows defining power of lens as compared with that of film.

From this experiment the conclusion is inevitable that in the center of the picture the lack of perfect sharpness while it depends on both residual aberrations and emulsion grain, the emulsion grain effect is greater than the aberration effect in most of the lenses tested. Getting away from the center of the field the aberration effect rapidly grows larger. Here the superiority of the Raytar lens is evident.

Reference was made above to the possibility of using such a test also to investigate the performance of a lens on different kinds of photographic material and for different kinds of light. Light differs, photographically, in respect of distribution of energy with respect to wave length. This is generally but not always apparent as a difference in color. Quality differences in motion picture practice are limited to a relatively small range. Incandescent lighting is doubtless somewhat redder than the ordinary arc or daylight but it is a mistake to think that it has no blue in it and it is equally erroneous to think that arcs emit no red and yellow light.

At any rate, the test described above permits employing color differences as radical as may be desired. Filters running from red to blue may be introduced between the light source and the test plate, where they cannot influence the performance of the lens by virtue of any optical imperfections in the filter, and tests can be made that will indicate the performance of a lens for any desired color. At the bottom of Fig. 2 are two series of shots marked 4 R and 4 Blue. These were obtained with a 50 mm Raytar lens focused with white light and exposed with a red and a blue filter respectively without refocusing. In spite of this very radical color difference the image quality is identical and the same as for white light. For this test an incandescent lamp was used and the filters employed were Eastman's Projection Red No. 24 and a C filter for the blue.

The result of the test was not surprising. The introduction of incandescent lighting and panchromatic emulsions into motion picture practice has led to some natural but generally unnecessary concern regarding color correction of objectives. This concern would have been well founded if low aperture lenses of 16 to 36 in. focus such as are used in commercial photography had been in question. The large aperture short focus lenses employed in motion picture photography are a different matter. For the former, the residual chromatic aberration of the colors other than those two for which chromatic correction is made, the so-called secondary spectrum, is of prime importance. In high aperture short focus lenses secondary spectrum becomes secondary in another sense. It becomes of less significance than other residual aberrations in the lens and also to mechanical considerations involving camera, film focusing, etc., hence the statement at the beginning of this paragraph.

Inasmuch as this subject has gone farther than speculation and conversation and has been discussed in the pages of this

(Continued on Page 22)

Projection Test Plates of 2-Inch Motion Picture Camera Objectives

I.
This column shows definition at center of the picture.

II.
5. mm from center

III.
10. mm from center.

IV.
15. mm from center.

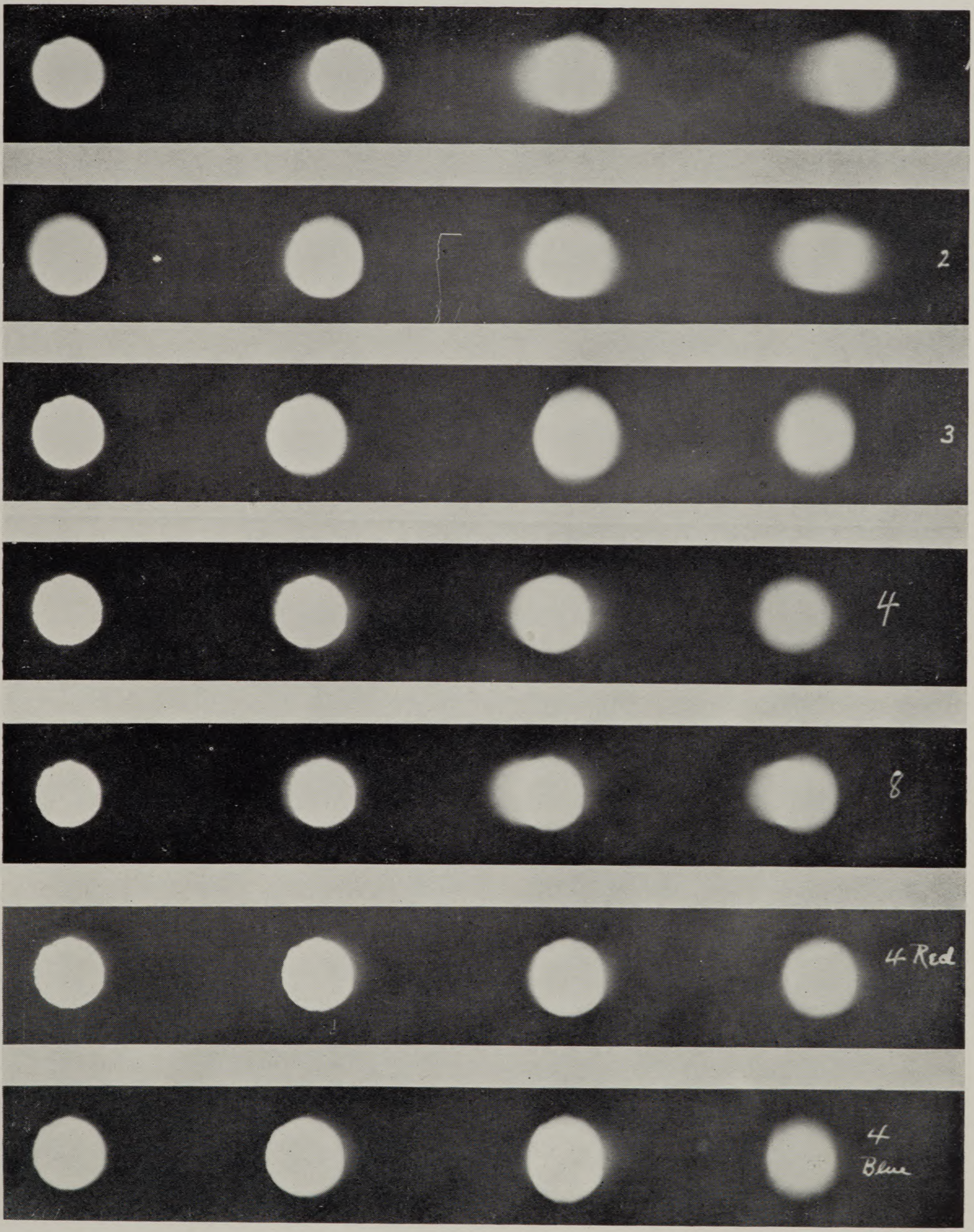


Fig. 2

Halation

by **DR. V. B. SEASE**

DuPont, Pathe Film Mfg. Corp.

HALATION is defined as a halo of light sometimes seen around the image of a bright object in a photographic positive print. In a negative it appears as a flare of silver along the edges of the bright object. It is most likely to occur in photographs of bright incandescent lamps, of strongly back lighted objects, of interior scenes including sunlit windows, or of the outline of a building against a blue sky.

It is clearly a phenomenon of scattered light. It is known that the crystals of silver halide in the sensitive layer may scatter light, but in the fine grained high speed emulsions of the present day it is doubtful if this scattering effect is ever responsible for more than a dulling of definition. True halation is caused by the reflection from the back of the film or plate of a certain amount of light which has passed through the sensitive coating. Sensitive coatings may be quite translucent. This is evidenced by the fact that in a bipack film a very strong image is recorded on the rear film by the light which has passed through the front orthochromatic emulsion.

The scattering which the light receives in passing through a sensitive coating means that some of the rays will strike the rear surface of the film or plate obliquely and will be reflected back into the emulsion at some distance from the edge of the image.

Halation is not a new phenomenon. It dates back to the days of the collodion plate. As early as 1867 we find an American inventor securing a patent on a black backing for collodion plates. Early workers encountered serious trouble with halation. They sought to remedy it in various ways. They recognized the fact that the rear surface of the glass or celluloid support was an excellent reflector of light, since the index of refraction of these materials is quite different from that of air. The surface of the support on which the emulsion is coated disappears because of the fact that the gelatine of the emulsion has approximately the same index of refraction as the support, so the early experimenters attempted to eliminate the rear reflective surface. They coated the back of plates with caramel, or other substances whose index of refraction is similar to that of glass. Dyes, lamp black, or other pigments were put into the caramel to absorb the light. Such back coatings accomplished the desired results. They were temporary and very easily washed off in the developer or in running water.

Other backing compositions such as asphaltum in benzene or such as pigments or dyes in collodion, gelatine, etc. were successfully used. However, a little more effort was necessary for the removal of those backings which were not water soluble.

There are many references in the literature to attempts at incorporation of dyes into the emulsion to prevent penetration by light. While the idea was fundamentally good, it was found that the dyes generally had a deleterious effect upon the photographic quality of the emulsion.

A number of schemes have been revealed for putting a substratum coating under the emulsion, capable of absorbing the light to which the emulsion is sensitive. An English inventor as early as 1893 disclosed a dyed gelatine coat between the emulsion and the plate. He claimed that the color might remain without serious annoyance in printing. Seyewitz recommended a coating of transparent red, orange or green dye between the emulsion and the plate. He noted that only a few dyes such as congo red and rosolic acid could be used, as most dyes diffused into the sensitive coating and reduced sensitivity. He preferred that the dye should be capable of being readily bleached so as not to affect the printing from the finished negative. The dyed substratum coating was indeed a beautiful theory but was hard to put into practice on account of the tendency of dye to diffuse into the sensitive layer.

While searching for suitable dyes to try in a substratum coating, Sandell recalled that lantern emulsions were orange colored, and he conceived the idea of coating fast negative emulsion upon a lantern slide plate. His anti-halation results were remarkable. Thus originated the double coated plate which has enjoyed a wide popularity. Such plates owe their anti-halation quality, however, not to the color of the undercoat but rather to the opacity of the fine grained undercoat and its ability to absorb light. Undoubtedly this has proved to be one of the most satisfactory methods for prevention of halation, as the anti-halation coating disappears in the hypo bath and leaves a perfectly clear negative without any extra operations of removing backings or discharging dyes or pigments.

There have been numerous patents for brown manganese compounds in an undercoat. These compounds are capable of being destroyed in a strongly acid fixing bath. A German firm covered molybdenum ferrocyanide in the same manner. The alkali of the developer was supposed to destroy the ferrocyanide.

Other workers have described the use of a colored support to prevent halation. In 1894 an English inventor defined certain permanent colors for either support or sensitive layer. A Belgian inventor revealed the application of a violet tint under the substratum or on the back of celluloid film. Celluloid tints are not easily bleached out, but a violet or blue tint offers very little interference in making prints. Workers with tinted film like those with dyed undercoats, have confined their efforts to the use of colors which absorb in the spectral region in which the emulsion is sensitive. Any yellow or red dye is effective as an anti-halation tint with orthochromatic film but panchromatic film requires a tint secured with two or more dyes whose composite absorption curve has approximately the same shape as the spectral sensitivity curve of the emulsion.

Thus it is seen that the problem of producing anti-halation emulsions has been tackled during the past from every angle. Early workers probably had more difficulties than the photographer of today. Although they had much slower emulsions, these emulsions were coarse grained and, therefore, had low opacity which allowed much light to pass through their coatings. The modern fine grained emulsions with their high opacity have done much to relegate halation to a position of secondary consideration.

Early workers also had emulsions whose sensitivity was mainly in the blue end of the spectrum, while modern emulsions are becoming more and more sensitive toward the red end. A gelatine-silver halide layer has a good absorbing power for the blue, or short wave lengths of light, but it is much more easily penetrated by the yellow and red rays. So the tendency to increase panchromatic speed more and more has called the attention of the photographic industry again to halation. But with a background of much experience in combating halation, it is certain that this industry will not allow the quality of present day photography to suffer on account of this defect.

Eastman Gray Base Super-Sensitive Panchromatic Negative Film

by **EMERY HUSE**

West Coast Division—Motion Picture Film Department, Eastman Kodak Company

PHOTOGRAPHERS have always been troubled with halation in their pictures. This halation which appears as a spreading of light around all the highlights is due to light which has penetrated the emulsion and which is reflected back into the emulsion again by the back of the support. On glass plates where the support is thin, halation is very serious but with the thin film base it is so much diminished that in ordinary photography it is negligible, and one of the variations which has always been claimed for film as compared with plates is the freedom from halation which the films give. Halation, however, is a relative matter. A spreading of the light which is utterly negligible in an 8 x 10 picture may be serious in a small film and very serious indeed in a motion picture frame. Negative film has, therefore, for years been made with a double coating of emulsion so that in addition to the other benefits conferred by this procedure, halation is reduced to a minimum. When working with glass plates photographers have been accustomed to diminish the effects of halation by coating the back of the plate with a "backing," which prevented the light from being reflected from the back of the glass and which could be removed during or after development. Backing is a messy operation and the soluble backing in the developer is not at all desirable but its variations in the diminution of halation have led to its wide spread use. The conditions of the motion picture industry are such that it has not seemed desirable to place a soluble backing on negative film but fortunately the same result can be obtained in another

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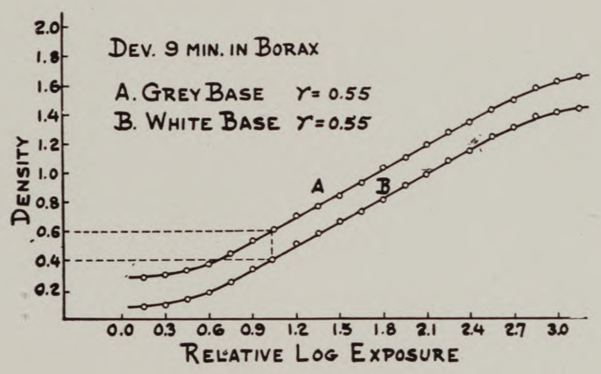


Fig. 1

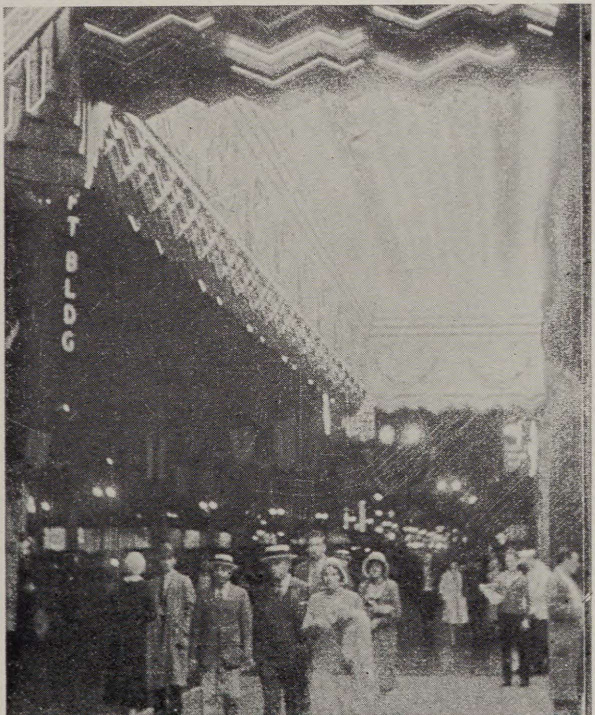


Fig. 2

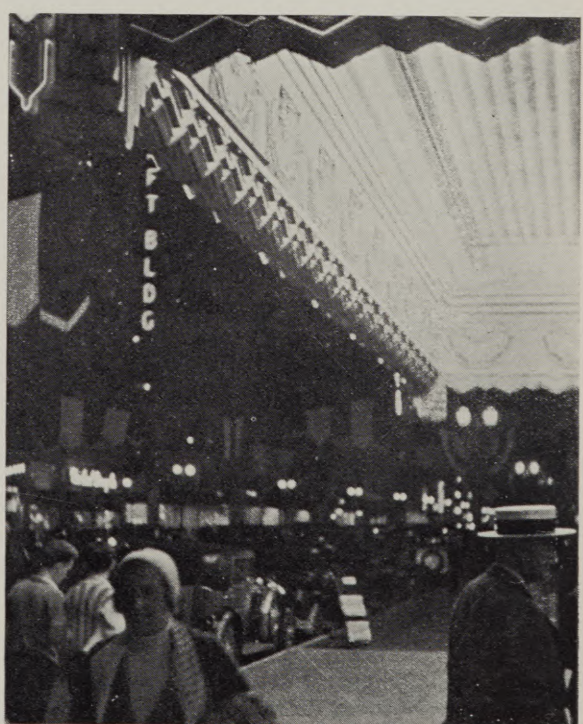


Fig. 3

The Leica Invades the Studios

With Some New Features Devised by Jackson J. Rose, A. S. C.

NOWHERE does one see more mechanical advancement than in the field of photography. It was not so long ago that photographers would hide their heads under masses of black cloth as they crouched behind big boxes with glass plates. Today step into most any Hollywood studio and you will see a photographer with a tiny Leica camera taking action shots that would amaze the photographer of old.

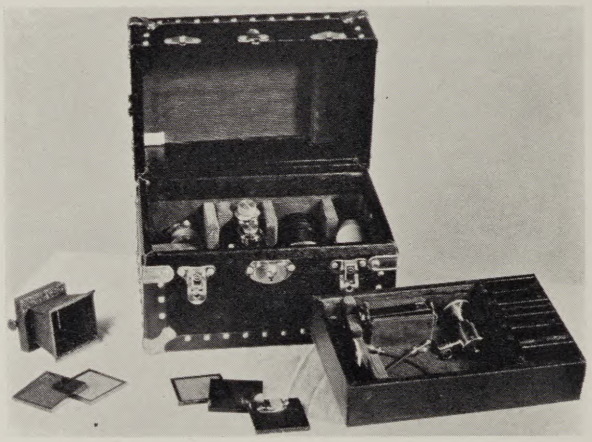
And now, Jackson J. Rose, a member of the American Society of Cinematographers, has devised several new articles of equipment for this little camera which should make it still more popular. These new devices consist of a cine filter holder and sun-shade and a new carrying case.

Mr. Rose and his Leica

This new cine filter holder and sun-shade does much to add to the attractiveness of the little camera. It makes easy the use of the many density and color filters, which in turn makes it possible for a cameraman to make tests of lighting and composition; for the camera takes the 35 millimeter fast film, and exact and accurate results may be obtained. Already a large number of cameramen are users of the Leica. Among these men are Mr. Rose, Gilbert Warrenton, Tony Guadio, Dan Clark, Arthur Edeson, and many more.

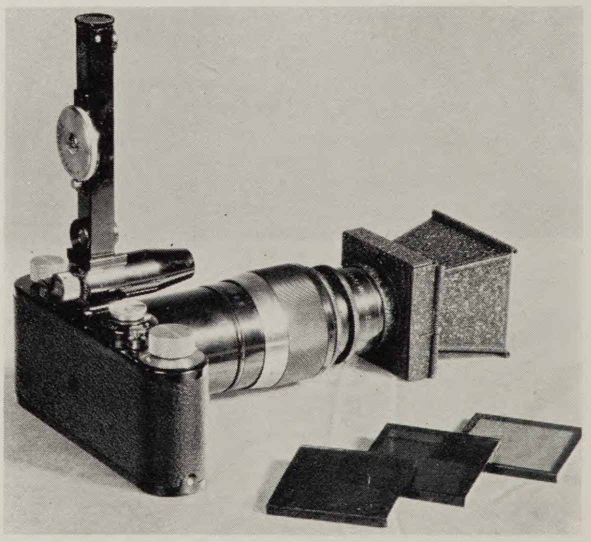
The cine filter holder and sun-shade are made of aluminum and are finished in black crack-a-lak. It holds two 2-inch square filters or gauze mattes. It fastens to any lens of the camera and is grooved to hold celluloid gauze mattes. It will not interfere with Universal view finder and will not cut in on the widest angle lens and can be put on or removed in a moment's time. A spring flap prevents leak light from entering on lens or filters. Rather a clever devise for the creating of which Mr. Rose deserves much credit.

The carrying case is an attractive case built of strong, three-ply wood, covered with grain leather and lined with corduroy. It has large tray for various accessories and holds the camera, 35 mm. lens, Universal View finder, three double magazine holders, cine filter holder and sun-shade, Winko angle view finder, Fodis range finder, cable release, tripod head, 14 two-inch filters and other accessories.



The new Leica carrying case

This little camera is a precision camera of the highest standard and is tremendously useful to the still man. Its cost of operation is negligible, for all the Leicas will never be able to consume the amount of short-ends which accumulate in the studios and which are often wasted entirely.



The Leica with its cine filter holder and sunshade.

The Leica camera equipped with the same fast film and lenses as the motion picture cameras, can be operated during

(Continued on Page 42)

Screen Definition

by **DR. L. M. DIETERICH**
Consulting Engineer

Part VIII

IN THE last article the production of a "circle of confusion" by a modern photographic lens was shortly characterized. Figs. 1 to 6 of this installment amplify such characterization in a graphical way and are enlarged line drawings showing approximate copies of actual photographs.

Fig. 1 shows the target, a white cardboard with ⅛" black circle C. A 50mm Zeiss Tessar lens f 3.5 was placed 15 feet from the target and focused upon it for Fig. 2. For Fig. 3 to 6 it was set for a 30 feet focus without changing its distance from the target.

The upper diagram of Fig. 2 shows the lens covered with the exception of two round holes $H\ H^1$ or apertures of 3.12mm diameter equivalent to the value of f16 diametrically opposed on a center distance of 10mm. The lower diagram shows a sharp image C^1 of the object C.

For Fig. 3 where the plane of sharpness was advanced to 30 feet, we find the image consisting of two separate images $C^2\ C^3$ of slightly reduced sharpness or definition.

For Fig. 4 the lens covering was turned for 180° during the exposure showing the image of the target point as a true circle of confusion.

The identical result was obtained by removing the slotted lens covering and stopping the lens down to an aperture of 13.12mm dia. equivalent to f 3.81.

For Fig. 5 the two apertures $H\ H^1$ were joined to a slot of 3.12mm width and 13.12mm length. The image result shows an approximately elliptical dot with a darker core and unsharp outline.

For Fig. 6 this lens covering was rotated for 180° during one exposure resulting in a circular dot of the same diameter as the length of the elliptical dot (Fig. 5) along its major axis.

The image result, a circular dot or disc with a dark center, gradually fading towards its periphery, presents the well known out-of-focus unsharp disc image of a point misnamed a "circle of confusion."

A study of these diagrams discloses some of the characteristics of so-called stereoscopic photographs, i. e. photographs taken with two similar optical means in parallax or at a distance from each other.

These diagrams, however, show only the parallactic effect for a two dimensional object.

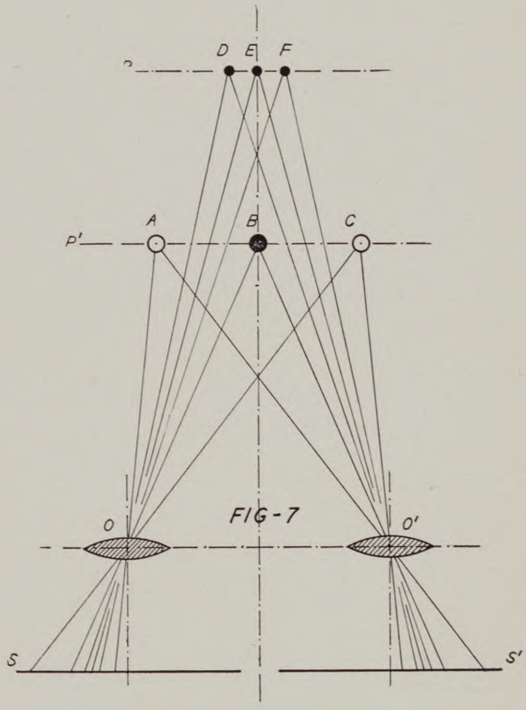


FIG-7

If we extend our observations to the three dimensional object field, conditions, of course, become more complex.

Assuming two fixed, horizontally separated lens apertures as shown in Fig. 2 and 3, comparable with bi-lens or binocular optical systems, and also for the present assuming that all object points are in focus, the analysis of diagrams Fig. 7 and 8 discloses fundamental characteristics of parallactic photographs, known as "stereoscopic couples." For simplicity's sake, absolute symmetrical conditions are assumed.

Object points A B C are supposed to be in one plane of sharpness, P, and object points D E F in a plane of sharpness P^1. The photographs or images of these points produced by the

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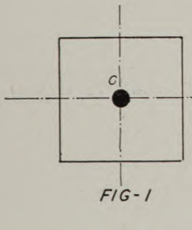

FIG-1

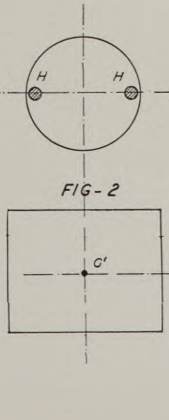

FIG-2

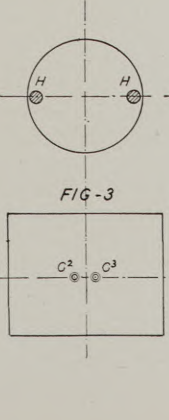

FIG-3

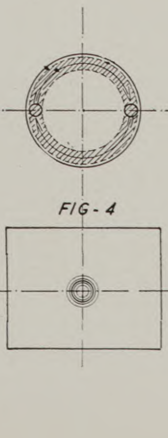

FIG-4

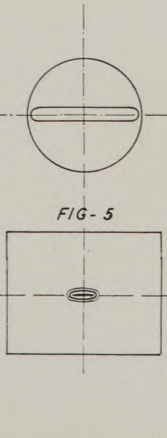

FIG-5

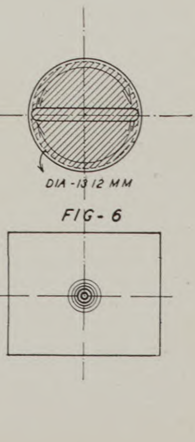

FIG-6

Hal Hall
SAYS

Congratulations

THE OTHER evening this writer had the privilege of seeing on the screen a motion picture called "Eyes of Science." It was a three reel picture made under the auspices of the Bausch and Lomb Company and showed how optical glass is made and dealt with the importance of optics in the field of science. But it is not of the subject we speak, excellent as it was, but of the cinematography. One of the finest pieces of master craftsmanship that this writer has seen. And it was photographed by Dr. J. H. Watson of Rochester, an amateur who would rather photograph than anything else in the world. The film was shown at a meeting of the American Society of Cinematographers, and when the last scene was finished these master artists of cinematography burst into applause that would have delighted the soul of any professional. A real tribute to a real amateur.

Credit

AS THIS page belongs to the editor on which to say just what he likes, we feel that none will think we are acting as a personal publicity representative when we say that Mr. Len H. Roos, member of the American Society of Cinematographers, and vice-president and general manager of the Tanar Corporation, deserves a little kindly comment. Always a hustler in the days when he was hopping from one corner of the Globe to the other as a free lance and newsreel cameraman, Mr. Roos, in slightly more than a year, has shown that you can hustle in the same way right here in Hollywood where so many are prone to take it easy and let the other fellow do it. Coming here a little more than a year ago seeking portable equipment that he could carry easily anywhere in the world, Mr. Roos met with disappointment. So he designed his own, started the Tanar Corporation and the result has been that he has been so busy as a manufacturer that he has had to give up cameraing. A real hustler, and a real fellow.

This Month's Cover

COURAGE is one of the most admirable qualities to be found in any man. The man whose face appears on this month's cover of this magazine has plenty of it.

Starting his life as a cowboy on an Oklahoma ranch, he has had one of the most colorful careers of anyone in pictures. From the ranch he joined a circus. Then he joined the army, cavalry, of course, and rose to the rank of Sergeant in three years. Then back to cow-punching. Then back to the army, and then back to cow-punching again. He then won a chance to join Miller's 101 Ranch circus in New York again. And from then on he was a riding sensation. As usual, he later drifted away from the circus and landed in Hollywood. At the Fox lot he received his chance and made good. Then he left pictures and took his own circus on the road and wound up broke. Sound pictures had come in, and everyone thought that westerns would be among the forgotten things of pictures, but this man stuck and Columbia finally gave him a contract to do eight pictures. That they were successes is shown by the fact that they now have him on a three-year contract. Yes, sir, this fellow—Buck Jones, doesn't know what it means to be licked.

Three Cheers

A HEALTHY note has been sounded in most of the studios in the announcement by most executives that there will be no cutting of salaries. Columbia led the way and was followed shortly by most of the others. This is good business. There are many ways of cutting overhead in the studios that will mean real saving, while cutting a few salaries merely reduces morale and produces little if any saving.

Lakin Not Sold

JUST as we were going to press Frank Arrousez of the Lakin Corporation asked me to run a line telling the industry that the reports that have been current in Hollywood to the effect that the Lakin Corporation has been or is going to be bought by any of several business organizations is all wrong. "We are not going to sell our lighting business," said Mr. Arrousez. So that's that.

Verboten

THUMBS seem to be down on future gangster films. Sane and serious thought regarding this type of film causes one, quite naturally, to feel that it is unwise to place before the eyes of our children pictures in which all manner of gun-play is depicted. Our children surely meet with enough temptation without deliberately showing them how easy it is to "bump a guy off." To make the pictures interesting the producers cannot help but make at least partial heroes of the gangsters. This is a bad example to place before children and the many morons who find their way into the picture theatres. Gangster pictures should be barred, no matter how much drawing power they may have.

Less Dialogue

THIS WRITER is still tingling with the thrill he received a few nights ago when he had the privilege of seeing the late Mr. Murnau's last motion picture, "Tabu."

What a picture! And what food for thought for the motion picture producers! If you have tired of the mostly stupid conversation of the over-talking talkies, go and see this picture. You will realize that dialogue is not necessary if you have a story to tell and an intelligent man to direct it. It also proves that you do not need a galaxy of "big names". In this picture you see a group of native South Sea Islanders as the cast. You see an unknown native boy and girl in the leading roles, giving performances that are sublime in their naturalness. Your imagination is allowed the chance to run riot, you do not have to listen to alleged "wise cracks" and bad speaking voices and worse lines. And when the last scene has appeared and the lights go on you feel like cheering for pictures that are told with the camera rather than with bad conversation.

A. S. C. Recommends Fast Film

THE American Society of Cinematographers, after an extensive series of photographic and laboratory tests of the newly developed "Super Sensitive" and "Special" Panchromatic Negative Films (commonly referred to as "Fast Films") made by its Research Committee and by many of the members at large, does hereby formally recommend the use of these new emulsions for all phases of commercial production.

In the opinion of the Society's Research Committee, the results obtainable with these new films are, with respect to photographic quality, in every way equal to those obtainable with the previous Panchromatic emulsions, and in many instances definitely superior. In addition, the new films present many marked advantages of a commercial nature, which should commend their use from a purely commercial viewpoint.

The photographic qualities of this new film are such that a considerably improved picture can be had with a very considerable decrease in the amount of light used for illuminating the set; or, conversely, with the present lightings and smaller lens openings, improved definition can be obtained without sacrifice of those qualities of softness which have always been the artistic aim of cinematographers.

The color rendition of the new emulsions is considerably improved, which is of great benefit in studio interiors, and in exterior landscape scenes, and particularly noticeable when extreme telephoto lenses are used.

There is no difficulty in the laboratory processing of the new films. In fact, they are beneficial to the laboratory personnel, inasmuch as somewhat more latitude in the proper developing time is permissible.

The increase in speed, or overall sensitivity of the new films is considerable. This is of great commercial benefit to the producer, inasmuch as it permits reductions of 40 percent or more (depending upon the individual technique of the cinematographer in question) in the amount of current consumed in lighting any given set. This is best obtained by the use of lamps of lower wattage, rather than in the use of fewer lighting units, as the successful use of this film depends chiefly upon the maintenance of the proper balance of lighting, which cannot be obtained by reducing the number of light-sources. In this connection, the development of more suitable, smaller, lighter lighting units for use with the smaller lamps suited to the new film, is strongly recommended as a measure which will vastly increase the speed and convenience of production. It is further urged, as is embodied in a separate recommendation, that the lamps used should be standardized at 120 volt units, and that the voltage delivered on the set should likewise be standardized insofar as is possible, at 120 volts.

This standardization of lamps and lamp voltage will go far to improve photographic quality, regardless of the type of film used, and to prevent retakes arising from photographic causes. The use of lamps of lower wattage will, as heretofore stated, reduce the current consumption by an average of forty percent, which, in the case of major studios, should mean an annual saving of approximately $25,000. In addition, the use of the smaller bulbs will result in lowering the temperature of a set by more than 20 percent, which will be of direct benefit due to the greater comfort of the actors, enabling them to work more efficiently and with less fatigue, and to the fact that the lower temperatures will not cause makeups to melt and run.

To summarize: the new, so-called "Fast Film" emulsions will in every sense prove a definite benefit to the industry. They will give photographic results at least equal to and in many cases superior to the results given by the present Panchromatic emulsions, at a very appreciable saving in the matter of lighting current consumption, and with much improved working conditions for the actors. With properly designed lighting equipment, this saving should be heightened by a greater facility of operation. "Fast Film" presents no problems in laboratory processing, and, in the hands of a capable cinematographer, entails absolutely no photographic or economic hazard. For this reason, the American Society of Cinematographers, through its Board of Governors and its Research Committee, does hereby go on record as highly recommending the use of the so-called "Fast Film" in every branch of professional cinematography.

Laboratory Department

Conducted by **EMERY HUSE, A. S. C.**

Principles of Sensitometry and Their Practical Application

Part 3

THE foundation of sensitometry as practised today was laid, as aforestated, by Hurter and Driffield about 1890. It is only natural that during the past forty years the principles originally propounded by them should be expanded and magnified. Although actual sensitometric procedure has changed appreciably, nevertheless the foundation laid by Hurter and Driffield was very important and it must not be lost sight of, that, but for them, photography would not, in all probability, have reached the high peak of perfection it now enjoys.

Any study which involves the measurement of sensitivity may be termed sensitometry. In photography use is made of this term and it may be defined as the science of measuring the light sensitivity of photographic emulsions. Inasmuch as such measurements involve the study of various sources of radiant energy and furthermore because the reaction of any photographic material to light is not evidenced until after development, the study of sensitometry must also involve developing solutions and the constituents entering into them. Therefore, photographic sensitometry in its broadest sense includes a study of the effect of all of those variables entering into the photographic process, both physical and chemical on the sensitive emulsion.

Sensitometry is applied in many fields. In the first place the manufacturer of sensitive materials uses sensitometry in the control of the product he is manufacturing. He also makes use of it in extensive photographic research work which leads ultimately to the improvement of such products. The users of photographic materials, such as astronomers, and quite extensively the motion picture industry, are making practical every day use of the subject in the maintenance of consistent results. It has been only recently that the knowledge and application of the value of sensitometry and its applications has been applied in the practical field. The last three years in the motion picture industry alone have seen an enormous increase in the practical application of sensitometric methods of control. This control was first applied to problems of sound photography but now control of both picture and sound is accomplished by sensitometry. The use of this science is increasing rapidly and with its use a fuller appreciation of its value is in evidence.

Before proceeding with the more detailed discussion of the many phases of sensitometry, it would be well to consider briefly the relationship between the logarithm of exposure and the densities produced by the development of the exposed photographic emulsion. These few basic points will be discussed later in full detail.

Briefly, the simplest method of measuring emulsion sensitivity of a photographic material is to subject the material to a series of graduated exposures and then subsequently develop it for a definite time in a predetermined developer. The resultant densities produced by development of the exposed strip can then be measured to determine the quantity of silver in each exposure of the graduated series. The quantity of silver is expressed in terms of density, which is defined as

$$D = \log O = \log \frac{1}{T}$$

where O is opacity and T is transmission. Knowing the exposure condition for every step, as well as the density, a curve may be constructed using as coordinates density and the logarithm of exposure, usually expressed log E.

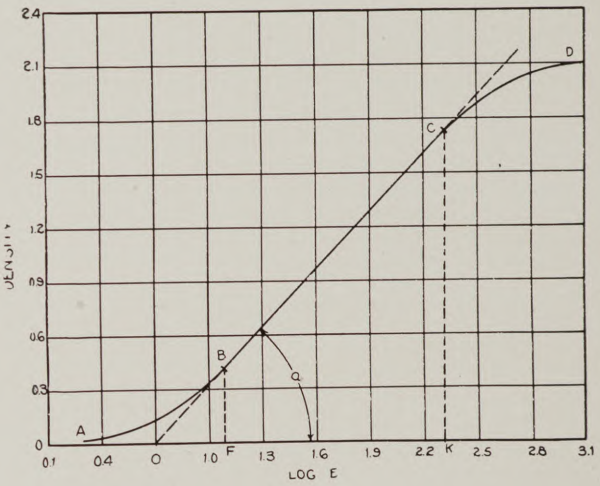

Fig. 1

Figure 1 shows a typical sensitivity curve for a definite series of exposures for a fixed development condition. This curve is also referred to as the H and D curve. The solid black line represents the smooth curve drawn through the actual experimentally determined points. An appreciable portion of this curve is a straight line, as indicated by the section BC, and represents the region of correct exposure, since in this region of the curve density is directly proportional to the logarithm of exposure and as a result brightness values rendered on this portion of the curve are directly proportional to the corresponding brightness values in the object. This direct proportionality is not maintained in the extremities of the curve. The section AB represents the under exposure, or **toe** portion, while the section CD represents the region of over exposure, or the **shoulder.**

The full sensitometric procedure to be valuable and useful necessitates very careful manipulation and involves the establishment of several fixed conditions. The first of these pertains to exposure and includes the standardization of a light source as regards quantity of light and quality (spectral composition), as well as a means of producing mechanically, or otherwise, a graduated series of exposures of known relative values. Secondly, development must be standardized. Following this it is necessary that a precise means of measuring density be set up and all of the three conditions mentioned above must be analyzed in a method of data interpretation, either in a statistical form or from curves. All of the material contained in these three articles to date is to be considered only as an introduction to the general subject matter of sensitometry. The next logical step is a consideration in detail of all the elements entering into the practical applications of sensitometry. The first of these deals with exposure and the next article will begin with this subject.

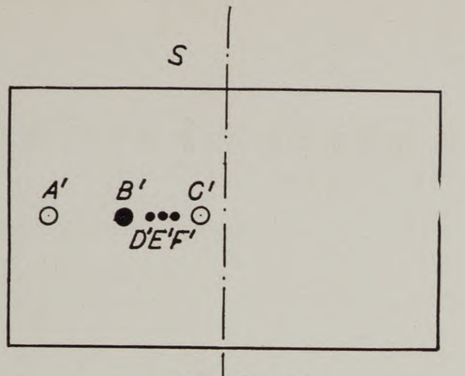

FIG-8

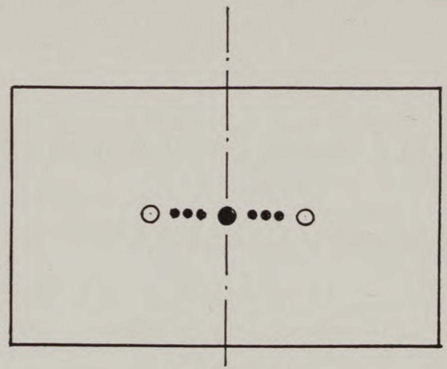

FIG-10

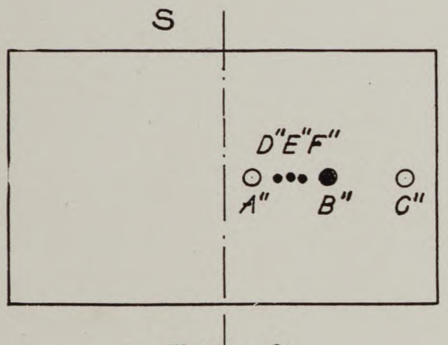

FIG-9

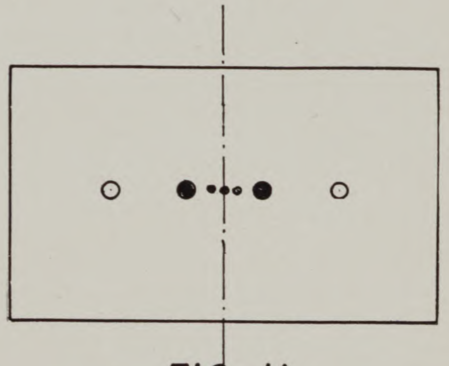

FIG-11

Screen Definition

(Continued from Page 17)

two identical recording system O S and O^1 S^1 are shown in their relative position or location values at S and S^1 and in Fig. 8 and 9.

Analysis (geometrical and otherwise) shows that the images of one plane object points in one plane of sharpness can by proper shifting of the center lines be brought into registration by superimposing directly or by projection the two images S and S^1. Image points A^1 B^1 C^1 and A^2 B^2 C^2 will coincide. Disregarding these image points, the image points D^1 E^1 F^1 and D^2 E^2 F^2 can also be made to coincide. If either of these groups coincides, the other image group, however, appears as a double image. Fig. 10 and 11.

In Fig. 10 A^1 B^1 C^1 coincide with A^2 B^2 C^2 or show a single picture of A B C, whereas D E F is shown double. In Fig. 11 D E F is shown as a single picture whereas A B C appear overlapping.

This short discussion intends to prove by simple graphical means that it is impossible to combine a stereoscopic couple into one true image of a three dimensional field.

Comparing these endeavors to produce natural vision effects by photographic means, other fundamental characteristics in natural vision have to be considered and analyzed. Automatic focusing and simultaneous convergence of the two axes of the eyes and the effect of the spiral ranging of sharp sight shall in the next article be shown as so far unattainable by photographic means—even in a theoretical sense.

As all these articles are restricted to motion picture screen presentation, they strive to analyze these screen results as presented to the "unaided" eye.

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Photographic Lens Tests

(Continued from Page 12)

journal it will not be inappropriate to look into the subject a little more in detail. We have no quarrel with any type of color correction that yields good results but we believe that it is misleading to claim there is only one type which is satisfactory. In spite of the fact that achromatic telescopes have been made since 1758 lens designers are not in complete accord as to just how achromatic telescope objectives can best be corrected for color. There is no convincing evidence that within the limits of the argument one type is not as good as another. For visual instruments of all kinds each lens designer prefers or is satisfied with color corrections possibly slightly different from those preferred by other designers and yet all of them may produce equally reputable instruments.

One reason for this, of course, lies in the fact that generally only two colors can be brought to a common focus. That means that there is necessarily a multitude of other colors coming to all sorts of other foci. If we were dealing with light of only two wave lengths the problem would be relatively simple but we have to deal with light of all the colors in the visible spectrum and the choice of which two wave lengths to bring to a common focus becomes a problem which probably does not possess an unique solution.

There is another complication, however, in the fact that if the designer brings together into a common focus two wave lengths for a given zone of the lens, say the central part of it, these two colors do not have a common focus for any other zone, say the marginal or an intermediate zone. Hence, anyone undertaking to describe the color correction of a lens, to be accurate, must state what zone he is discussing and how the color correction varies from zone to zone. He may say that he is talking about the average effect of the whole lens for a given color when he states where the focus is for that color. This, however, is possibly still more difficult to fix than it is to prove that a given color correction (which comes very close to being a meaningless expression) is the best one to adopt. The statement that if two colors are brought to a common focus for the center, let us say, of a lens the same two colors will not have a common focus for the margin, implies the existence of spherical aberration in one or both colors. You may rest assured that there is spherical aberration in both and that it is different in amount in these two colors and that furthermore spherical aberration exists for all other colors in still different amounts. An earlier article in this journal reports data supporting the above statements. (1)

In the presence of spherical aberration it is difficult to say what the position of best focus is—it is, in fact, impossible. Visual and photographic judgment will differ and, to make matters worse, photographic judgment will differ with exposure. Then, too, diffraction adds its bit to render the position of best focus indeterminate until with everything considered it takes sublime confidence to state where either the best visual or best photographic focus lies even for monochromatic light.

In view of this uncertainty of position of best focus, a subject discussed by H. Dennis Taylor in a very interesting little book on The Adjustment and Testing of Telescope Objectives, it is surprising to read in a recent paper (2) published in this journal that a certain lens of 3 in. focus should have chromatic aberration of 0.003" according to computation but that in actual practice it was found to measure less than 0.001". Now, to be certain that there is chromatic aberration greater than zero and less than 0.001" in a 3" focus lens means that the position of best focus for each of the colors in question must be determined with an error smaller than 0.0005". In view of the uncertainty of the exact position of a focal point it is a fair question whether mere reproducibility of measurement may not have been regarded as a proof of accuracy.

The explanation advanced for the discrepancy between computation and measurement amounts to saying that the picture is taken principally by means of the light which is brought to a focus at the film and that light which is not in focus has comparatively little effect. If this is true it can easily be shown to constitute another reason for the fact that it is impossible to prove that any one type of color correction is superior to all others.

This argument is not intended to lead to the conclusion that the distribution of residual color aberrations in a lens is a matter of no concern and that it can be left to chance with the certainty of acceptable performance but it is intended to show that there is no reason to believe that slight changes in the type of color correction of motion picture lenses will result in any better average performance.

The test proposed above is a laboratory test in that it eliminates practically all of the uncertainties which are able to lead so easily to false conclusions when lenses are tested in the ordinary way but at the same time it is a practical test in that it is photographic and its results are interpretable without much effort of the imagination. They are identical with an enlargement perfectly executed of a photograph taken in the ordinary way but on a practically grainless infinitely thin emulsion with almost perfect precision of focus and with a perfect camera. The tests need nothing to supplement them to disclose all the characteristics of the performance of a lens except a test for distortion. This, in fact, could be determined from a test of this sort but it would have to be carried out in a somewhat different manner. The tests reveal the fact that the Raytar lens is unequalled by any of the well known motion picture lenses in its even quality of image over the area of a motion picture frame and that color differences much more violent than any that occur in motion picture practice do not ruffle its placid disposition.

In closing, the writer wishes to say that he has partially completed experiments on another type of test which when finished he hopes also to lay before the Society in another paper.

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(1) Bielicke, American Cinematographer, September 1928, page 13.
(2) Dubray, American Cinematographer, November 1930.

◆

The Silent Mitchell Camera

(Continued from Page 9)

deavors have done so much to aid us in perfecting this machine."

Mr. Mitchell is perhaps unduly modest, for when this writer inspected the camera he found it to be exceptionally quiet; most of what little noise there was being very evidently traceable to the driving motor. In its present state, the camera appears to be sufficiently quiet to use uncovered in many instances, and with only the lightest of insulating bags under every condition. With more silent motors, the new camera should be suitable for almost every studio purpose. In any event, it marks a great step forward in cinematographic engineering and practice.

The Research Committee of the American Society of Cinematographers will shortly undertake a series of both scientific and practical tests of the silence of this camera, the results of which will be published in an early issue of this magazine.

◆

Schoedsack Leaves to Make Bengal Picture

ERNEST B. SCHOEDSACK has completed his staff and will leave this month for India to make the jungle sequences for "The Lives of A Bengal Lancer," which Paramount will release next season.

AN IMPROVED METHOD OF BLOCKING OUT SPLICES IN SOUND FILM

NOW the sound track need no longer be painted out at the joints to silence splice noise. The Eastman Sound Film Patch enables the laboratory worker to block out joints with greater ease, speed, and uniformity.

The patch is made of light-weight, opaque film. For convenience in handling, it is provided with a quickly detachable finger tab. With the aid of this tab, a simple but accurate registration block, and cement, the patch is quickly applied to the film.

Because of its design, the patch is practically inaudible in projection. At the same time it obscures a minimum of the sound record, and assures fast, accurate treatment of all splices. These factors make the patches and the block a valuable feature of Eastman Service.

Eastman Sound Film Patches, per thousand	$5.00
Eastman Sound Film Patcher (registration block)	4.25

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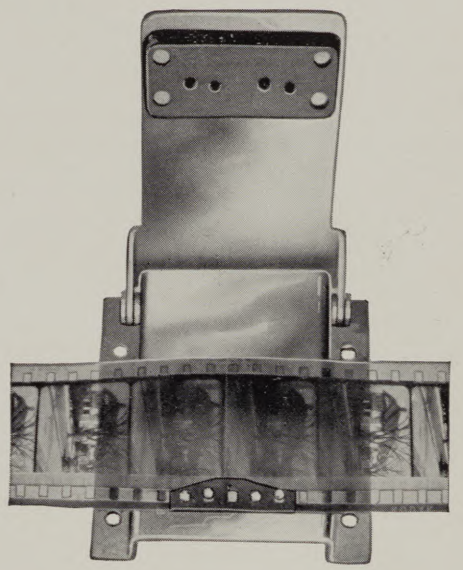
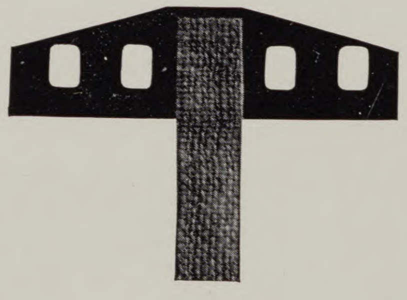




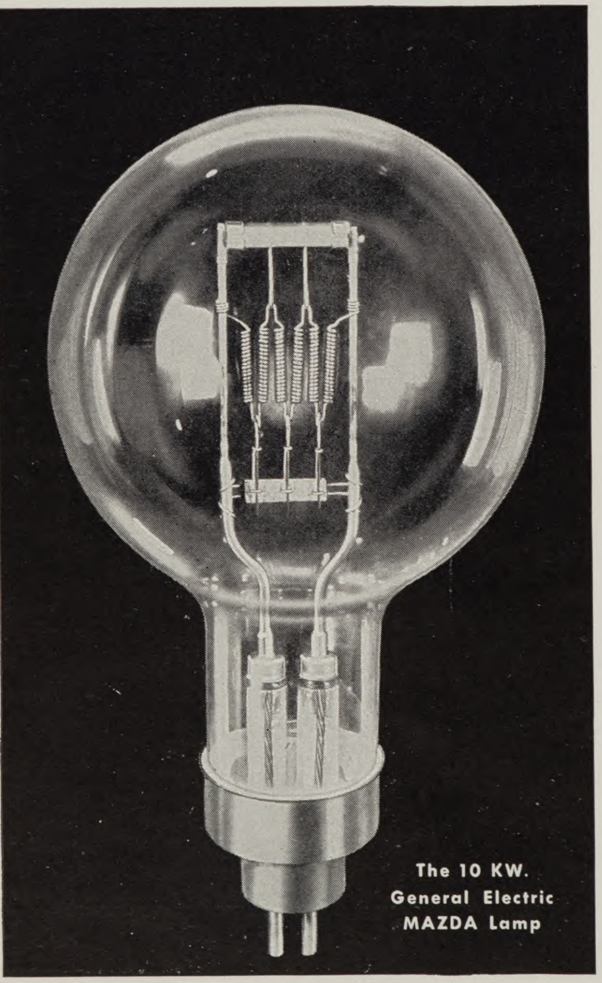
BIGGER ROLES IN PICTURES!

THE 10 kilowatt General Electric MAZDA lamp for photographic purposes has become more serviceable, more indispensable to the cinematographer than ever before.

This is because alert equipment manufacturers everywhere have perfected new equipments that enable the 10 k. w. lamp to realize every lighting potentiality . . . to operate to its fullest advantage in every lighting capacity.

The 10 k. w. lamp, substantially lower in cost this year, is particularly indispensable on large sets where it must be at considerable distance from the subjects being photographed. This lamp, with the fine new equipments available, forms a lighting unit that is easily set up, simply operated, flexible in its uses and thoroughly satisfactory. National Lamp Works of General Electric Company, Nela Park, Cleveland, Ohio.

Join us in the General Electric program, broadcast every Saturday evening over a nation-wide N. B. C. network.



The 10 KW.
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..In the Realm of Sound..

Chronograph Reverberation Meter

AN ANNOUNCEMENT from Western Electric states that the Bell Telephone Laboratories have devised an electrical method of measuring reverberation time by a reverberation meter. This has been done for the exclusive use of the Acoustic Consulting Service of Electrical Research Products.

"In the past" says the announcement, "time measurements have generally been made by a method originally used by W. C. Sabine, in which an observer measured with a stopwatch the length of time required for a sound of known intensity to decay to threshold as measured by the ear. This method gives surprisingly consistent results where the decay is slow and in the absence of noise. Where the decay is rapid, however, or in noisy locations, this method is rather difficult of application. Also it is a recognized fact that uncertainties may be introduced because of the variation in threshold between observers and with time in the same observer.

"The electrical method is similar in principle to the Sabine method, the primary difference being in the substitution of an electro acoustical ear of controllable threshold sensibility for the human ear.

"An electro acoustical ear or microphone converts sound energy into electrical energy which is amplified and rectified to operate a relay. This relay is so constructed that when the rectified current exceeds a certain value the contacts open and condenser is charged by a battery. When the sound energy, which has been converted into electrical energy, drops to the lower limit of sensibility of the relay, the contacts close discharging the condenser through a spark coil causing a spark to jump from a discharge point to the drum. The drum is rotated at a known constant speed. The discharge point may be set at any place on the scale. If the amplification of the amplifier is then varied in definitely known amounts and the point is moved along the scale accordingly, a series of points representing the decay of sound energy will be recorded if waxed paper is placed upon the drum. This method, therefore, gives graphically an exact history of the decay of sound from which the reverberation time may easily be obtained if the speed of the drum is known.

"In the measurement of reverberation time the source of sound may be anything which provides a constant energy level, the sources most commonly used being an oscillator or a frequency record with an associated reproducer and amplifier. The source is carried through a key associated with the meter, so that the tone may be interrupted.

"The employment of this instrument yielding the exact history of the decay of sound has permitted fundamental research in the behavior of sound decay in complex auditoria. It has contributed to the development of a new fundamental formula of decay which is now commonly used and is known as Eyring's formula. Due to the fact that the decay of sound is shown graphically with this instrument, a double reverberation time has been found in some cases. This double time may have been suspected, but previous to the development of this instrument it has never definitely been measured; due to the fact that other methods of measurement give only the total time for sound to decay a given amount. The cause of this double slope has been discovered and eliminated through the use of this instrument. It has also proven of great value in determining the effect on reverberation time of coupling rooms, either acoustically or electrically.

"In addition to its uses in purely research fields, this reverberation meter has a wide commercial application. It has been successfully used in the measurement of reverberation time of theatres, review rooms, sound recording stages, sound picture stages, broadcast studios and other auditoriums. Its use has given the reverberation time-frequency characteristic of the auditoria measured, thereby permitting more accurate correction of their acoustic condition. This is more than is ordinarily done in the mere computation of an auditorium in which consideration is generally given to acoustic conditions at only a single frequency. The meter has also been used in the measurement of the acoustic absorption of sound absorbing materials by the reverberation chamber method giving more consistent and more accurate results than any other known method."

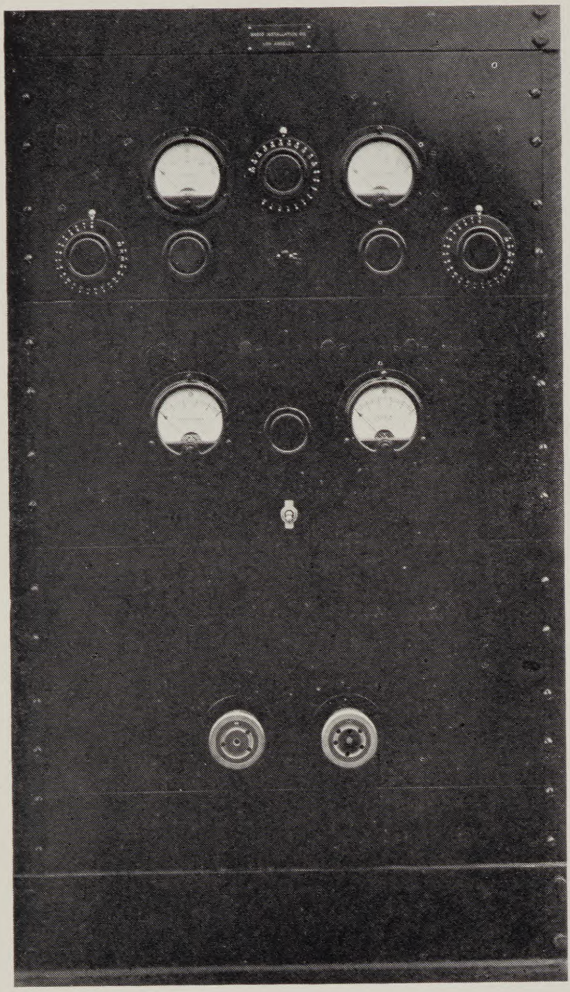
●

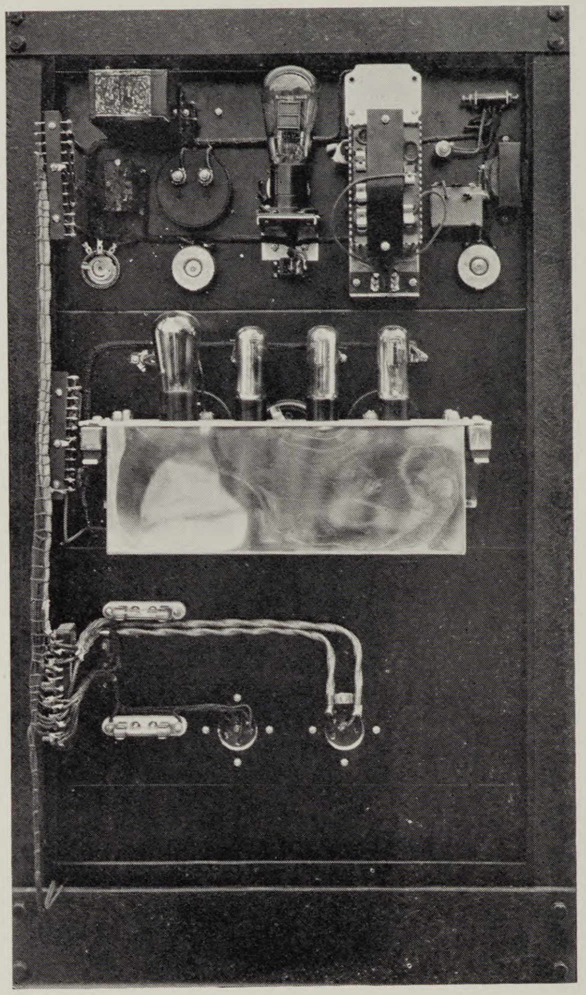
Operation and Uses of Sound Meter

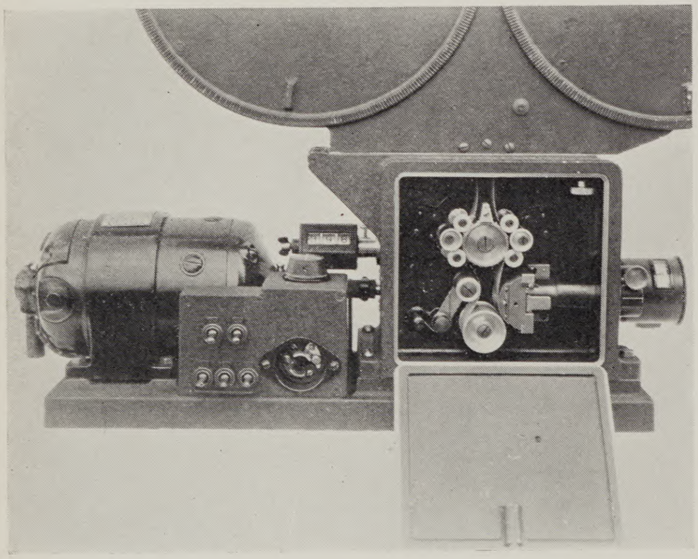
THE MEASUREMENT of loudness of sounds has in the past been generally confined to audiometric methods. As the name implies, these have involved the judgment of an observer, and some standard source of noise. Such measurements, while useful, are not essentially accurate, depending upon the skill of the observer and changes in the physiological and psychological condition of the individual. Moreover, the readings so obtained are only relative, and if sounds are of different character, the readings are apt to be misleading. Measurements by instrumental means have been, in general, of no comparative value and were generally expressed in some arbitrary units selected for the particular measurements at hand. Values so obtained bore, in general, no relationship to the physiological effect; i. e. loudness, annoyance, or any other reaction of a human observer. Moreover, the inability to establish a common point of comparison made it impracticable to make relative judgments between any two sets of readings.

The sound meter herein briefly described is based upon the fact that the effects of noise are primarily interpreted through the human ear—it was developed by the Bell Laboratories for exclusive Erpi use. The instrument is, therefore, designed to record the effects of noise in terms comparable to the loudness sensation as judged by the ear. It consists essentially of a microphone, amplifier, weighting network, indicating meter, and necessary battery supply, contained in two cases, both together being portable by one man. The microphone picks up the sound, converting it into an electrical current which is a counterpart of the original sound. This is then amplified by a vacuum tube amplifier and actuates a meter reading the loudness of the sound directly in decibels. The decibel scale is an arbitrary one in which each unit represents approximately the smallest change in loudness that can be detected by the normal ear. Zero of this scale is near the threshold of hearing or the point at which sound becomes inaudible in a very quiet place. Since the apparent loudness of a sound of specified energy is not the same for all frequencies, the amplifier is adjusted by means of a weighting network to stimulate the sensitivity of the ear. At frequencies near 2000 cycles per second, the amplifier is most sensitive and decreases in sensitivity with increase or decrease in frequency from this

(Continued on Page 29)







The Mitchell Recording Camera.

The film is driven by the upper sprocket, the lower roller being free to revolve with the film. A quartz wedge, mounted in a one mill slit, in the slit block assembly, transmits the light from the recording lamp to the moving film. This slit block provides an absolutely smooth and non-abrasive surface to the passing film, and can not clog or fill as does an open metal slit, thus eliminating the possibility of scratched film and varying recording sound levels caused by loss of light through a partly clogged slit.

Upper right is back view of the Amplifier Rack. The upper panel represents the Noise Reduction Amplifier and associated equipment. Below, in the center, suspended on rubber shock absorbing cushions, the high gain recording amplifier, sealed against moisture in a metal catacomb, is mounted. On the power and terminal panel at the bottom, may be seen the two system power protective fuses, and the shielded speech leads to the extended mixer panel.

Part grouping and overall shielding provide maximum efficiency. All leads are cabled and protected against moisture, and handy terminal strips for all circuits are available.

A metal shielding and protective cover fits closely over the entire back of the assembly, to complete the protection. The overall gain far exceeds the maximum necessary for all purposes, and the amplification characteristic presents a straight line of equal amplification over all audio frequencies from 50 cycles to over 8000 cycles.

Upper left is front view of Amplifier Rack. This iron channel relay rack mounts, at the top, the new noise reduction amplifier, in the center the high gain recording amplifier, and at the bottom the extended mixer power and speech cable terminal panel. These panels are metal and of the finest machined appearance. The dials and knobs on the upper panel control the percentage of ground noise reduction and other recorder functions. The four meters are, top left: High voltage; top right: recording light carrier current and volume indicator; lower left: amplifier tube current; lower right: filament voltage. The row of buttons at the top of the center panel allow the instant measurement of the current of any tube in the amplifier. One switch, on or off, at the bottom of the center panel, controls the entire system.

A New Studio Sound System

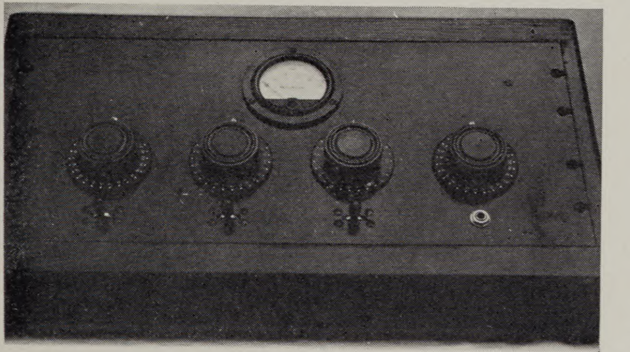
Los Angeles Firm Introduces Equipment Designed for Independent and Foreign Producers

DESIGNED to meet the needs of independent and foreign motion picture producers, the Radio Installation Company, of Los Angeles, has introduced a new studio sound system to the industry. It is known as the "Rico" sound system.

According to officials of the Radio Installation Company, this equipment was designed by their engineers after an exhaustive study of the needs of the independent and the foreign producers who found it difficult to meet the cost of the higher priced sound equipment. This survey was made by one of the company's engineers who spent the greater part of a year in the foreign production centers.

Briefly, the "Rico" sound system employs the double system of recording. A Mitchell recording camera is used, driven by a Westinghouse motor tied in synchronism with one or two associated camera drive motors, all controlled by the switches mounted on the sound camera, and are thus available for one operator. A tachometer and footage meter are also provided. The equipment also includes a portable extended mixer and volume control panel. This may be placed on the set in view of the action and the recording engineer may mix the three microphones furnished with the set, if that many are used.

The makers of this sound unit have incorporated the new method of noiseless recording in their equipment. Another very important feature of the equipment is the fact that it has been designed for use in any and all climates. Throughout the entire system elaborate precautions have been taken to guard against moisture, the bugbear of the tropical climates. For example, the entire high gain amplifier unit is impregnated in a catacomb to protect it. Every part that can be affected by moisture is specially treated, and the makers declare these parts to be absolutely moisture proof.

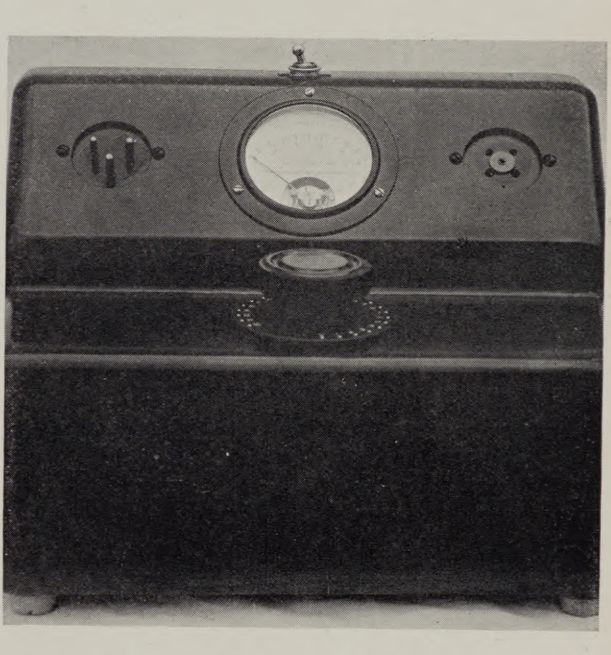


External Portable Mixer, Over All Gain and Volume Indicator Panel.

The first three positions from the left are the mixer controls for three condenser microphones, the switches below the dials providing a direct addition or removal of any of these microphone units, at will. The right hand dial is a master mixer or overall gain control, and below, the plug for the recorder's headphone. In the center above, the recording light carrier and volume indicator meter is located.

This panel, coupled to the recording rack by long electrically shielded cables, may be taken on the set in action, where the recording engineer may "mix" the sound from one or all of his microphones, all within sight.

The front panel is of metal and the entire unit is carefully shielded.



Output Current and Recording Light Calibration Set.

Of inestimable value to the recording engineer is the Output Measuring Set provided, with which the recording lights are calibrated and the percentage of ground noise reduction is set. This unit is mounted in a compact and sturdy metal case, and is factory calibrated.

The following list gives the complete "Rico" unit as it is shipped:

High Gain Recording Amplifier. Latest Noise Reduction Amplifier. Three 2-Stage Condenser Microphones. Two Synchronous Camera Drive Motors. Two Camera Silencing Covers. Portable Extended Mixer. Mitchell Sound Recording Camera. One Microphone Boom. Power Supply Generator Set. Twelve Tested Recording Lights. All Cables, electrically shielded, for microphones, extended mixer and Camera Motors. Two Recording Camera Magazines. One Output Testing Meter. An additional list of 35 items make up a "spare part" list also furnished.

On the amplifier rack are mounted the noise reduction amplifier, the high gain recording amplifier and the extended mixer power and speech cable terminal panel. A metal shielding and protective cover fits over the entire back of the assembly. The company engineers say that the overall gain far exceeds the maximum necessary for all purposes, and that the amplification characteristic presents a straight line of equal amplification over all audio frequencies from 50 cycles to over 8000 cycles.

Bell & Howell Announces Automatic Sound and Picture Continuous Production Printer

"ECONOMY," coupled with the highest "quality standard," is the watchword of the Motion Picture Industry today. The inception of sound pictures and their universal acceptance by the theatre-going public have exacted from the technicians of the Motion Picture Industry the application of knowledge accumulated through the efforts of scientific research throughout the country.

During the short life of sound pictures, rapid strides have been made which have resulted in great improvements in sound recording and reproduction.

It is obvious that the printing of release prints of utmost quality so as to assure the best possible presentation of the picture and the most faithful reproduction of sound is an essential factor in the success of any sound picture production.

The Bell & Howell Company has created a "new fully automatic continuous sound and picture production printer," which is now being exhibited and demonstrated to the Motion Picture Laboratories on the West Coast.

This apparatus, which is the result of several years of experimentation by the engineers of the Bell & Howell Engineering and Research Laboratories at a cost of over $200,000, permits the simultaneous printing of both the sound and the picture records, and its fully automatic operation suggests its comparison with the automatic screw machine which has practically revolutionized machine shop practice and its economics.

The following will outline some of the revolutionary features of this machine:

1. **FULLY AUTOMATIC OPERATION:** After being set up, the printer does not need any further attention except for threading it with raw positive stock.

It runs in either direction so that the negative, after the initial threading, does not require further handling nor inspection.

2. **LIGHT CHANGES:** These are secured through the use of a film travelling matte running between the printing light and the printing aperture. A positive and instantaneous change of the light intensity without alteration of its spectral characteristic is thus obtained for each scene and, if desired, for any portion of any scene. The light changes have been divided into thirty logarithmic steps, ranging from one to thirty, each step representing a ten per cent exposure increase over the preceding one. The latitude of exposure from lowest to highest is sixteen times.

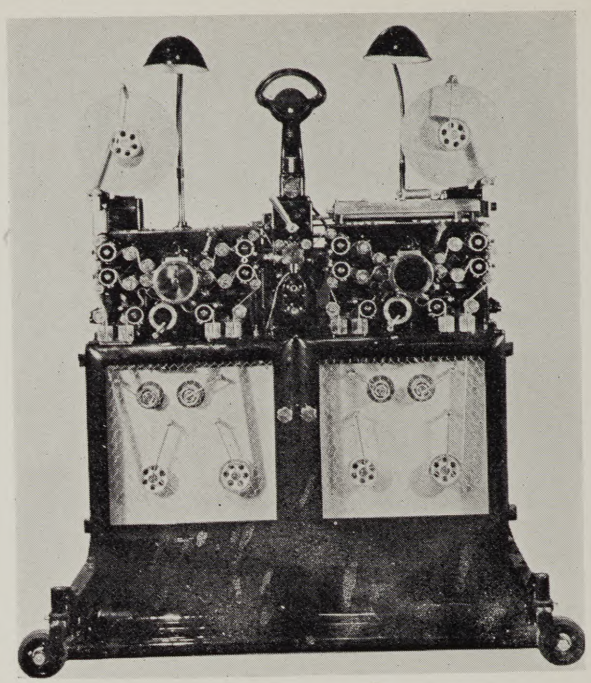
The film travelling matte is inclosed in a dust-proof compartment together with the negative, and the handling of both (after the original setting) is therefore eliminated regardless of the direction in which the machine is run and the number of prints that are to be made.

3. **PRINTING LIGHT:** Standard 250-watt, 110-volt, T-20 monoplane filament bulbs on prefocusing base are used.

4. **PRINTING SPEED:** A speed of sixty feet per minute is recommended. The machine can be especially adapted for higher speeds if desired, in which case lamps of higher wattage up to 500 watts can be used if necessary.

5. **PRINTING VALUES:** The densitometric control of the printing light values is absolute for a predetermined development "gamma" which insures at all times the exact duplication of print densities for both the picture and the sound records.

6. **CONTACT:** Intimate contact of the negative and positive films is secured by air pressure. Two cushions of filtered compressed air are formed at both back faces of the films at the printer gate. This eliminates frictional contact of the films with the printing aperture and the aperture gate.



The New B. & H. Printer.

7. **REGISTER:** An improved main sprocket similar in design to that of the B & H model D printer insures perfect registration within maximum tolerable limits of film shrinkage.

8. **CLEANLINESS OF FILMS:** Combination compressed-air and vacuum units cleanse both the negative and the positive film as well as the film travelling mattes before entering and after leaving the printing apertures and prior to winding at the take-up reels. This double action assures perfect cleanliness regardless of the direction in which the machine is operated.

9. **TEMPERATURE CONTROL:** The heat generated by the printing lamps is dissipated through an ingenious cooling system, which insures the proper temperature for all parts of the machine as well as a comfortable temperature for the printing room irrespective of the number of machines in operation. The cooling system also insures dust-proof lamp chambers.

10. **LUBRICATION:** A fully automatic lubricating system supplies the proper amount of oil to all working parts of the machine every two minutes. A minimum of personal attention is therefore required. Special precautions have been taken to prevent the escape of the lubricating material, especially at film-contacting or any external points.

11. **DRIVE:** The machine is positively driven throughout. All film guide rollers are of the dry ball-bearing type. The motor is of the synchronous type insuring constant speed.

12. **BAFFLE LINES:** A special printing head is provided to print (simultaneously with the picture and the sound records) two black baffle lines (or light shields) between picture and sound record and between sound record and film perforations. The key-number printing for both sound and picture records is done at the main heads.

The above main features of the apparatus suggest by themselves the utmost accuracy and duplication of results in "release printing," as well as considerable economy in operation due to the almost complete elimination of the necessity of constant personal attention and the time-saving factor which it involves.

Several protection features have also been incorporated, rendering the printer entirely "fool-proof" and eliminating all possibilities of wastage.

(Continued on Page 40)

Operation of Sound Meter

(Continued from Page 25)

value. The dynamic characteristics of the meter are also adjusted to simulate the ballistic qualities of the ear. Thus the meter indicates visually to an accuracy of about one decibel, the extent to which the ear is affected by a sound. The range of the meter, in the interests of portability, is slightly less than the range of the ear. However, it is not anticipated that it will be required to measure to absolute threshold, nor sounds of actually painful intensity; and for practical problems the range is, therefore, adequate.

Where a continuous graphic record is desired, a level recorder may be substituted for the visual indicating meter. The recorder can be adjusted to produce a graphic record of sound covering any period of time. The substitution of this device for the visual indicator alters the dynamic characteristics of the meter, since mechanical limitations preclude any possibility of a recording device fluctuating as rapidly as noise. However, if peak noise levels are not required, the level recorder is extremely satisfactory.

The meter alone merely indicates loudness and gives no information relative to the character or frequency distribution, which is equally important in any noise study. The frequency distribution may, however, be determined by the meter in conjunction with an analyzer attachment. Either broad band analysis to determine general characteristics of noise, or single frequency analysis for an exact determination of individual components may be made.

The meter because of its accuracy and ruggedness has allowed loudness studies of sound, which hitherto could not be accomplished with existing equipment. With the meter, observations may be taken under the most severe conditions, since the meter and observer may be at any convenient location, and the microphone placed at the point desired.

Obviously, the uses to which the meter can be put are manifold; surveys of noise conditions, determination of acceptable levels in various types of buildings, compliance of equipment with specified levels, are typical of one field of employment. Studies of loudness of other sounds, such as music, with relation to the performer or with relation to the architecture of the auditorium, represent another type of application. The control of uniformity of manufactured products by means of acoustic measurements is itself a wide and distinctly useful field.

Certain limitations in the use of the noise meter must be observed since it cannot discriminate between different sounds but indicates the total loudness of all sounds picked up by the microphone. Consequently, if it is desired to measure a sound not appreciably louder than others striking the microphone, it is generally necessary to stop all sources other than the one creating the sound to be measured. In some instances, it is possible to measure sound not appreciably higher or even less than the surrounding or background noise by use of the analyzer, providing the sound differs considerably in frequency composition from the background noise. The analyzer is adjusted to pass the frequencies of which the sound is chiefly composed and reject all other frequencies. Consequently, sounds of relatively high level, providing they do not fall within the band passed by the analyzer, will not affect the meter reading. Other limitations include the acoustic conditions surrounding the measurements, which must be fully accounted for to avoid errors.

Low-Price Photophone

AN all-AC-operated sound reproducing equipment designed for theatres of small capacity up to 500 seats has been launched by RCA Photophone, it is announced by Sydney E. Abel, general sales manager. At the same time the company has placed in effect new and more attractive terms of payment. The special equipment, priced at $1,600, may be acquired by exhibitors for a down payment of $100 and $25 weekly for two years.

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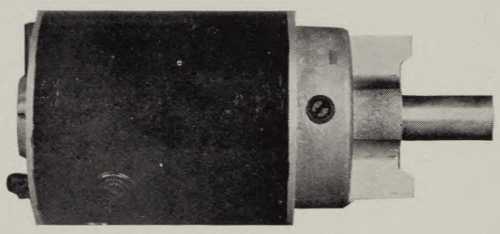

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Amateur Movie Making

by WILLIAM STULL, A. S. C.

DECIDEDLY, the most important development of the month, as far as 16mm. cinematography goes, is the introduction of Super Sensitive Reversal film. Fast negative film has proven a boon to the professional cinematographer, and Super Sensitive Reversal film should prove even more useful to his amateur brother. It will make it possible for the amateur to photograph under lighting conditions that would previously have been utterly impossible. It will enable him to get his normal exterior scenes with better color-rendition, and smaller lens openings. It will enable him to use his extreme telephoto lenses to far better advantage. And it will open up to him a whole new field of artificial-light cinematography.

But—caution must be observed in the use of this new film. The results obtained from any film are governed directly by the amount of thought used in making the picture, and nowhere must more care and thought be used than with this new emulsion. It offers great opportunities for technical improvement of one's work, and at the same time, gives equally great opportunities for the sort of failures that arise from careless, thoughtless work. When these failures happen, one must try to discover just how they came about, rather than immediately damning the film as useless.

The first, and most obvious point to be guarded against with this film is, of course, over-exposure. Over-exposure is always dangerous in reversal film work, as the reversal process accentuates its unpleasant effects; with Super Sensitive reversal film, over-exposure is positively fatal. Therefore, cut your exposures down vastly below what you think will under-expose—and then cut them down some more! For exterior work, fast film will give you a chance to become familiar with the neutral density filters which, though rarely used by amateurs, have proven themselves indispensable to professional cinematographers. Furthermore, this new film will give you a chance to become familiar with the orange colored "G" filter, which is very useful, and with the red "A" and "F" filters, by which you can get very interesting night effects by daylight. These filters are not, I believe, regularly furnished in mounts for 16mm. cine-camera lenses; but you can get them in the 2" square flats, and use them in any of the several adjustable holders made to take this size and adapted to almost any lens.

Another point that requires particular attention with this new 16mm. film is the matter of lighting. This film tends naturally to give a somewhat softened image, so naturally the lighting of the subject must never be flat. More than a few professional cinematographers have come to grief on this point; they forgot that improved speed does not necessarily mean exaggerated contrast. Therefore in lighting scenes for this film, bear in mind that the emulsion will not create contrast where there is none, and light your scene accordingly. For exteriors, the best lighting for general use is a cross-light, or, at times, a back-light; but never a flat front-light.

For interiors, the new film has tremendous advantages. You can use vastly less light than you would otherwise. For ordinary medium close shots, you can get excellent results with only 300 to 500 watts. Therefore you can now make interiors without having to invest heavily in lighting equipment, although the efficient reflectors of the better amateur lighting units will still prove of great benefit. But, what is most important, by using more light-sources, of smaller wattage, you can begin to attempt the artistic modeling effects that you see in professional pictures. Instead of using but one or two lamps, you can use four or five small ones, and arrange them so that you get the best out of your subject.

Furthermore, with this new film, you can have a great deal of fun trying for unusual lighting effects. Since fast film came into studio use, it has been a standing joke that some cinematographers used so little light as to make it seem that they were virtually lighting their sets with matches and cigarette-lighters. Now the amateur, with his smaller sets, can go the professional one better, and actually use matches! I have lately seen tests made by amateurs on the new fast film in which the only illumination came from the match which the subject used to light a cigarette! Obviously, the possibilities of the new film for such trick lightings are endless. Furthermore, if one already has the lighting equipment required for interiors on the older film, he can, with the new film, illuminate larger areas, and get long-shots as well as closeups.

Taken as a whole, the introduction of this new film for 16mm. use is probably the greatest boon ever offered the thoughtful amateur, for it will enable him to do many heretofore impossible things with his camera, and to do the accustomed things better. Most important of all, however, it will force him to proceed more cautiously and thoughtfully with his work, which, in the long run, should prove of far more benefit than is directly obtainable from any new film or lens, for, after all, the little grey cells are the most vital accessory to any camera.

Making It Interesting

With the coming of summer, everyone of us has outlined any number of films to be made. There is no dearth of subjects; but the question arises, how can we make the subjects, which are so interesting to us, into films that will be equally interesting to the other fellow? This is quite the same problem that the professional producer encounters in his daily work. He must please an audience numbered by the millions; and he has more than his personal pride (however important that may be) at stake; he has hundreds of thousands of dollars invested, which must be made to come home to roost, bringing some profits with them. So, how does he go about making a picture?

First of all, he studies his subject, whether it be a drama, a travel-film, or a purely documentary reel. He decides just what is the essential part of the subject, and how this essential thought can best be brought out. Then he prepares a written blue-print of his picture—a scenario or script. From this more or less detailed outline, he proceeds to make his picture, making sure first, that the whole outline is perfect, and then that each scene as it is shot is likewise perfect. Then he assembles his film, and again eliminates all that is unessential. And there is his picture!

The same method can well be followed in personal filming. Of course, it would be foolish to prepare an iron-clad scene-for-scene script for a personal film-record of a holiday, but it is even more foolish to attempt to make such a record without giving some thought beforehand to the elimination of the unessential details. Similarly, in making record films, you should decide what sort of technique you want to apply. Will your film be treated as a straight newsreel, as a personal memoir, or as a sort of drama. Will you, in other words, just make an ordinary record of the occasion, will you photograph what are, to you, the high spots of the party, or will you

(Continued on Page 47)

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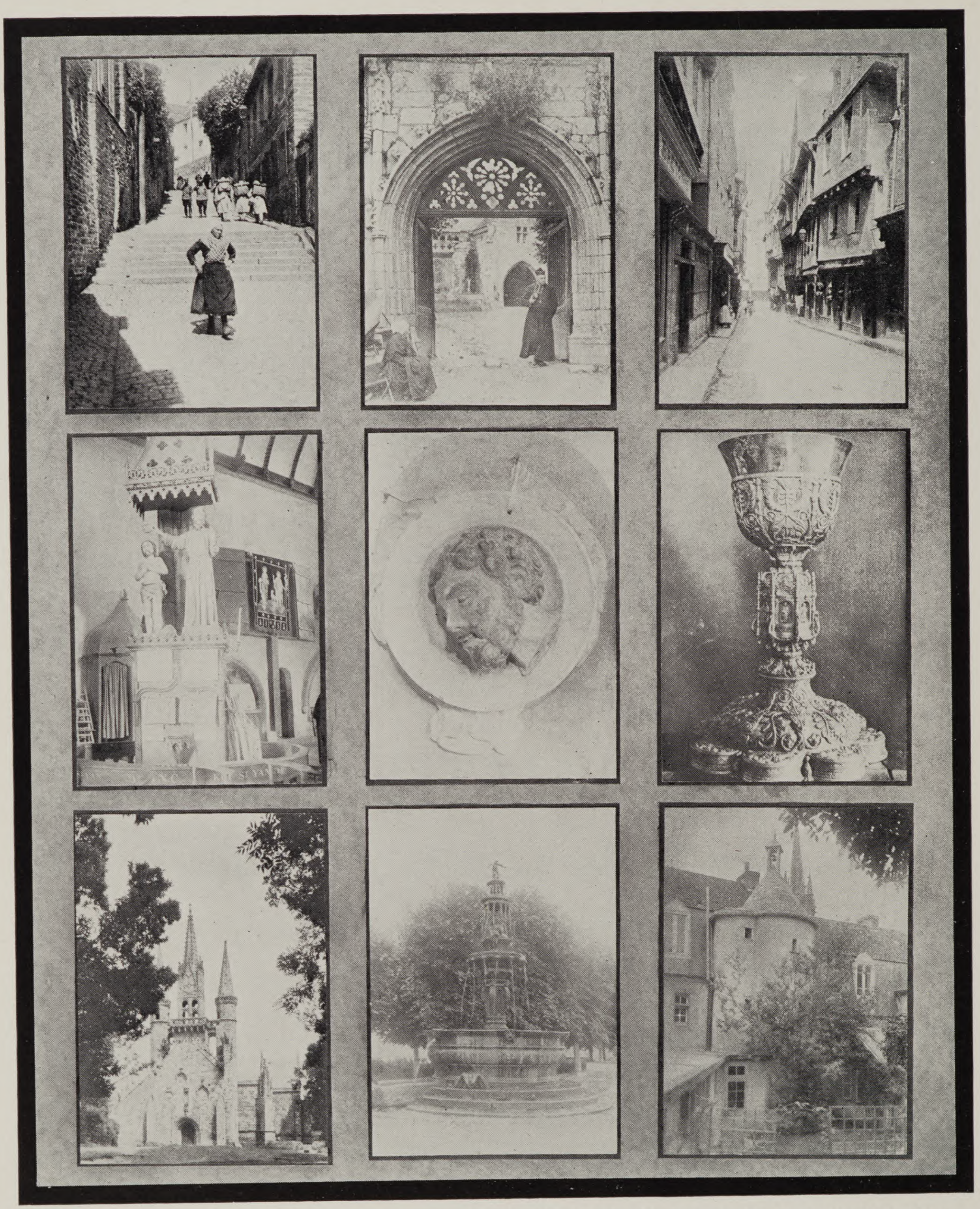
Max Factor's Panchromatic and Technicolor Make-up for the Screen

Max Factor's Theatrical Make-up for the Stage



Upper left, Morlaix. Showing off the new sabots. Upper center, Churchyard gate, St. Jean du doight. Upper right, Street, Morlaix. Left center, Baptism of Christ in Church, St. Jean. Center, Head of St. Jean. Right center, One of the beautiful "treasures" Chalice at St. Jean (N. D. Photo). Lower left, St. Falaise. Lower center, Fountain of St. Jean. Lower right, Grand Hotel St. Jean et des Bains.

Babbling About Brittany

by LAWRENCE GRANT

This is the fourth article of an unusually interesting series which Mr. Grant has written for this magazine. The next will appear in the August issue.—Editor's Note.

MORLAIX is quite a pleasant change in so far that I do not recall anything for which it is famous, at least famous and interesting to travellers. It is a very busy manufacturing place though, lace, and tobacco holding first rank as far as I know. It is a good center for your headquarters while making side excursions to very interesting villages within easy reach. It has an art gallery, and a bridge or viaduct which is quite the sight of the town. The little city is built on two levels, the busiest part being in the valley, and this very high bridge spans the main section of the town.

It is an imposing engineering accomplishment, probably it would be described over here something like this: "Morlaix is spanned by a fine viaduct which passes over the city at considerable height, and is a good example of building skill." But the French "Guide Johan" says: "Le viaduc monumental, qui domine la ville, lui donne un caractere special, un aspect a peu pres unique en France." And somehow, that seems to make it sound better than it is. I always think that the French words used in ordinary talk, such as "monumental," and the music of the French language, make everything sound more splendid and more promising than events bear out, and I believe that is why diplomats chose the French language for interchange of notes and the drawing of treaties. They sound splendid, but don't mean so much.

These two levels are connected by some narrow and picturesque alleyways for pedestrian traffic. Please see the woman in the one illustrated lifting her skirts as she gets in front of the camera to show off her new sabots, which very likely were made at the little factory we saw at Lannion in the last chapter. These alleys are picturesque, but picturesqueness at a price, as it is all over Europe. Imagine—a pretty girl—a moonlight night—the steps of an old city—ivy covered walls—steps worn by mailed feet of Kings and Crusaders—distant music from the town below—compatibility—propinquity—unity of desire and purpose—and then—smells—smells made by—well, anyhow—**smells**—that drive romance away, and you to fresher air.

Whether it is "Pardon" time or not, St. Jean du doigt, a little to the North and by the sea must be visited, and not only this fascinating sleepy little place, but its neighboring villages Plougasnou, Tregastel, and Locquirec. You see here how reminiscent of Cornwall that is,—"Tregastel," and how it calls to mind the old doggerel:

> "By the Tre- Pol- and Pen-
> Ye shall know the Cornishmen."

and you will find all over Brittany these "Tres and Pols and Pens" abounding, with "Ker-" as an alternative prefix to names.

You will probably stay at the Grand Hotel St. Jean et des Bains, which again sounds like an imposing caravanserai with minions and varlets around you, whereas it is really a quaint and lovely little inn, full of paintings, all of Brittany subjects, left there by artists for sale.

This place really is one of the famous ones. For its "Pardon," for its church "treasures," for its Fountain, and as far as I am concerned for damp beds.

Damp beds in out of the way places and in "off season time" are not uncommon in Europe. There are several devices for testing them, and it is just as well to be provided with one of them.

"What **is** a damp bed?" you ask.

In America owing to every house being warm throughout they are, providentially, unknown. But in Europe, alas, they are common. It simply means one of two things, or both. Either the whole bed has long been unoccupied, and with no central heating, the room and everything in it has become damp, or the sheets having been washed and properly ironed, have not been put in front of the fire, (the usual way) or in a dry warm room to take the final dampness out. Or both these things are existing. An experienced traveller can tell by putting his hand in between the sheets before retiring, and certainly he can tell after being in bed for a minute or two. Also you may put a hand mirror in the bed, and draw it out quickly. If it has a filmy appearance on the glass then the bed is damp. You can buy special detectors for the purpose. But no matter how you find out, and I beseech you to find out, if damp, do not sleep in that bed.

The strongest constitution cannot stand against it, and you will either immediately or in the course of a day or so be ill, in some one of various ways, and either mildly or seriously according to your robustiousness.

After the Grand Hotel St. Jean et des Bains I got as far as Landivisiau, when without a moment's warning I had my first introduction to lumbago. Had I not been robust, and had I not enjoyed excellent health always, I should probably have had pneumonia. However into bed I was carried, and of course, knew nothing of how to proceed. A little French doctor came, and having no electric pad, no rubber hot water bottle, either of which is all you need, he proceeded to deliver heat in such an old fashioned, ingenious way that I wouldn't have missed it for worlds.

He opened a box in which eight little individual custard glasses were stored. Then he tore off eight little pieces of absorbent cotton. He placed a piece in each cup. Then he turned me over, and bared my lumbar parts for the fray. He picked up glass number one, took out the cotton, and lit it. Then he replaced it in the cup, and approached me stealthily.

With a quick and deft motion he pressed the circle of the cup on my quivering flesh. Of course the lighted cotton immediately ceased to burn for lack of air, as was intended, but the warmth remaining in began to "draw" on the pain. He repeated this operation with the other eight glasses, till my back resembled a group of crystal mole hills, and the "drawing" was quite noticeable and rather comforting, or should have been, but in recounting this I have made one misstatement, for his deftness abandoned him on the last glass, air was not immediately excluded, the cotton continued to burn, and a small portion of me, like my namesake St. Lawrence, was suitably grilled. I carried the mark for well over a year.

I had to stay in bed for several days, and when I recall the gentle hands of the two comely Inn maids who tenderly lifted me and looked to my least want, I wonder if it was not preordained in my lucky stars after all.

One other thing should be taken along with you, a collapsible rubber sponge bath. Hot water in vast quantities will be willingly carried to you, but you will find few bath rooms, and few even common tubs for bathing.

The Church of St. Jean possesses a large and marvelous collection of "Treasures," of which the most ornate and beautiful are the Chalice and Cross, both glorious examples of gold-smith's art. Then they have many other treasures of less intrinsic value, but immeasurable religious worth. As they appear listed in a published book to be obtained at the Church, I will quote from it: "Le doigt de Monseigneur Sainct Jehan, (this means the finger of St. John Baptist) enchasse en argent dore; la teste de Monsieur Saint Meriadec, aussi enchassee en argent, (and I hope this is either the "last will and testament" or an old fashioned way of spelling the word "tete" (head) but maybe it is what it sounds like for they make relics of strange parts and pieces in Brittany) une image d'argent de Monseigneur Jehan Baptiste; une fasce avec deux oells d'argent; seize calices d'argent (sixteen chalices for one little village church!); trente deux chandeliers de cuivre, deux croix," and finishes—"la liste est interminable." And I believe it.

I like the old wording "Monseigneur" for St. John and only "Monsieur" for St. Meriadec. It displays a nice sense of distinction in a democratic spirit. At the Revolution all titles were swept away, and everyone became "Citizen" with a gradual acceptance of "Monsieur" as a form of address after the first violent revulsion against "class" had passed by. So we have in France "Monsieur le Duc" this, and "Madame la Comtesse" that, democracy seeming to be satisfied with the retention of title so long as the revolutionist prefix of "Monsieur" goes before it. So the Saints were democratised also, and "Monsieur" is placed before "Saint," but in the case of the Great Fore-runner, they stretched the order of precedence and made him a "Monseigneur."

Now, when you enter the church, in front of you and arresting your attention immediately is the Baptism of Christ by the "Monseigneur" in colored statues; it is the piece de resistance of the place, and as the proper construction of a group representing one full grown man baptising another presents certain difficulties of posing, the ingenious mediaeval artist hit upon the simple expedient of making John considerably taller so that the act becomes easier to portray.

Bits and pieces, personal and private pieces, of Saints are grouped together in a frame below the big group of the giant John baptising the diminutive Jesus. Bits of the arm of St. Modeste; of the leg of St. Alexandre; of the palate of St. Anthony; two unidentified, but very interesting looking bits of St. Generosi; a small portion of Ste. Fortuna; and a rather excessive and intimate bit of St. Benigne.

All the labels are clear and in place, but unfortunately some of the "bits" have fallen to the bottom of the frame. I could not help speculating, if ever they should be replaced, as to who would determine just which was which, and how shocking it would be if the piece, the very interesting piece, of St. Generosi should happen to be put where Alexandre's leg should be, and the leg credited to St. Generosi. However, probably the finger of "Monseigneur" would come to their aid and infallibly indicate their correct reassignment.

The Fountain of granite and metal in the church yard again shows St. Jean baptising Christ, while at the very top a benign God of curious shape, looking, I must confess, like a gorilla, regards the matter with smiling favor. The water starting from the top is so directed that a spray continually drops on the head of Christ, thus eternally baptising him.

Inside the church on the wall hangs a salver. A most realistic representation, again in natural colors, of the head of St. Jean, and I wish you to notice that his headless body is behind the salver which is held in his own hands. Rubbing heads on his head is very beneficial for ills of the head. The colors were so faded that it was hard to get a clear showing of this relic.

The finger of St. Jean, or rather the silver case containing it, is rubbed on the eyes of all people during the festival week, and though rubbed on each with only the most perfunctory wipe of a towel, thus apparently spreading rather than curing eye trouble, I did notice that the great majority of people there did not need spectacles.

On "Pardon" days crowds come from surrounding villages bringing their banners; young girls dressed as brides carry the treasures in procession; a little lad dressed as St. John leads a lamb by a ribbon; and they proceed up a hill to where a great bonfire is prepared. On the church tower a priest lights a torch, releases it to a taut wire from him to the bonfire, the peasants stand round the pile of wood, the torch slides down the wire, the fire is kindled, and all the crowd call out: "An Tan! Antan!" ("the fire—the fire"). This torch is called the dragon, and the custom is of great antiquity.

There is one peculiarity about the "Pardon" of St. Jean du doigt. At all these celebrations in other places, when the day's religious exercises and processions are over, the evening is given up to jollification of various kinds, carousing and singing for the older men, dancing and such other "divertissements" as commend themselves to youth, peasant as much as peer, and these gaieties may continue, as at Guingamp, into late moonlight parties, in the square, in the lanes, in the woods, whence no one has to "walk home," because the situation which causes so much unwilling trudging over here, would never arise over there on these intimate and privileged occasions.

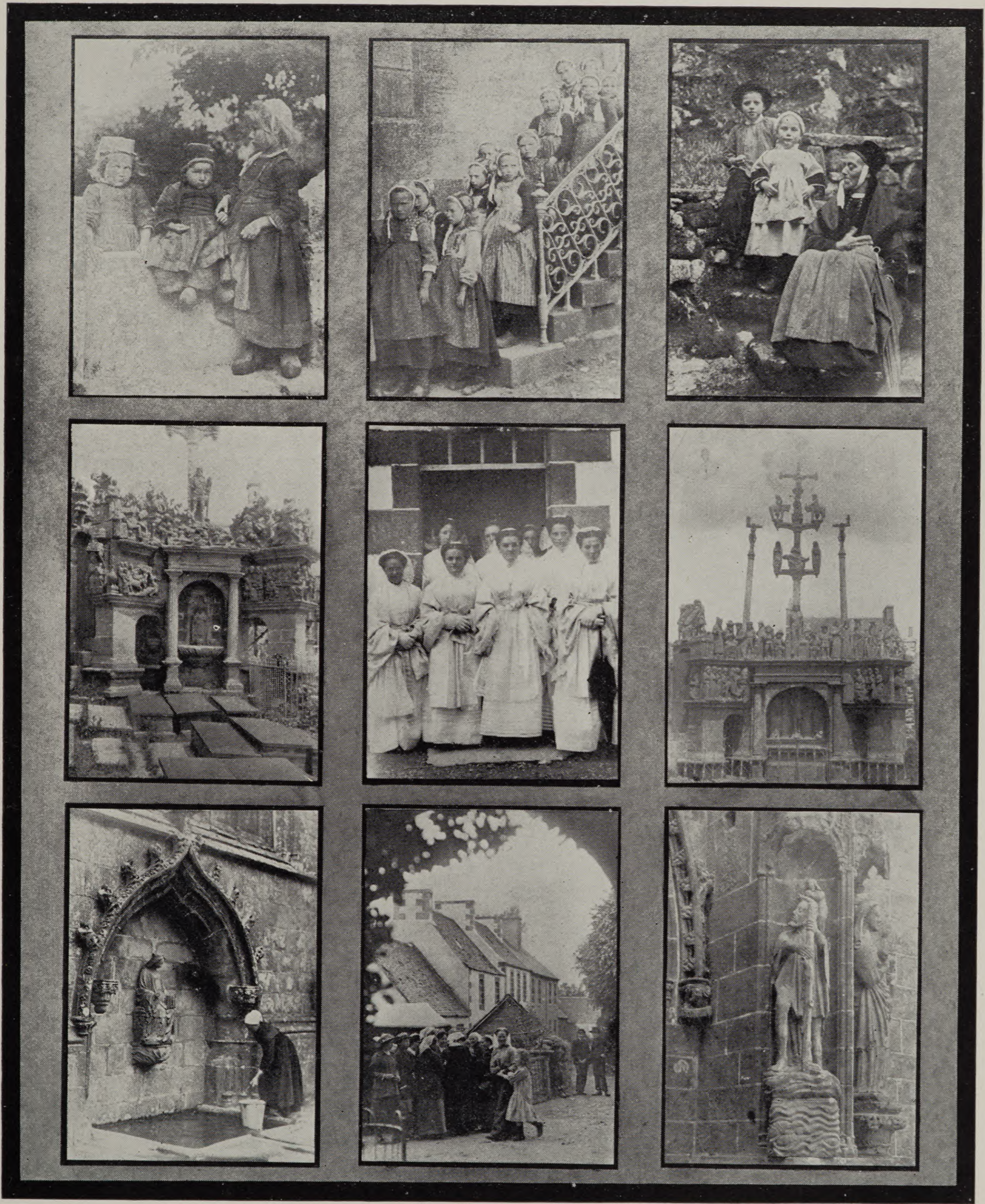
But at the "Pardon" of St. Jean du doight they do not dance. For did not the great John the Baptist lose his head through a dancer? This prohibition is of great antiquity. Many years ago one man held a private party in his cottage, and there was a little quiet dancing, but by morning a fire had destroyed the place and all the people in it. This was so obviously a visitation of divine wrath, and **not** drunken carelessness with a match, that the lesson has never been forgotten.

From Morlaix it does not take us long to get into another kind of Brittany, the district where you will see most of the curiosities called "Calvaires." These Calvaries are dotted about here and there and were, I think, erected after the cessation of a great Plague. They are large monuments which carry on the top of a solid base, a reproduction of the Crucifixion, with the three crosses, and Roman soldiers, and weeping followers grouped round the center cross.

Round the sides of the large base is generally told the story of the Life of Christ, and at the corners some special incident, or outstanding figure, the latter, however, frequently departing from the biblical story to record some outstanding bit of local history or legend. For instance in the corner of the Calvary of Plougastel-Daoulas a lady of good family in the district, but of ill repute morally, is shown as being thrown into hell by the devil. She was guilty of having robbed a guest staying at her chateau of all his very costly clothing and having given these things to her lover, who immediately turned out to be the Devil himself; so she is depicted in the sculpture without any clothing at all, a rare figure in church carving, most of the figures not only being fully clothed, but dressed, not as you would expect in the traditional flowing garments of the bible period, but in the Breton's dress of the 16th and 17th centuries, which was much the same as it is today. So you will see the twelve apostles and other familiar characteristics in the "Brag-o-bras" which is Breton for "plus-fours" and the large felt hat with long velvet streamers. Nothing new under the sun, all this was done ages before modernist actors thought of playing Hamlet in modern dress.

But the most unexpected and delightful things in and around this mid-west coast are the costumes, especially those of the school children. It is the enchanted land of "Kate Greenaway" come to life. The boys with large floppy caps having small peaks, short, eton shaped coats of brightest blues and greens and browns, loose ties, wide trousers of buffs and greens, and the girls with long skirted dresses of every shade and color, even the faded condition of many of them adding to their artistic effect. Their little close fitting cap will have as many as three different colors, with embroidery between each section. Coming from other villages, where bright colors and heavy embroidery may be reserved for Sundays and holi-

(Continued on Page 39)



Three upper photos, Plougastel. Picturesque children of the "Kate Greenaway" country. Left center, Part of Calvary of Guimilliau. Center, Young girls at St. Jean du doight selected to carry the relics. Right center, Calvary of Plougastel. Lower left, Well of St. Salaun at Folgoet. Lower center, Crowd buying at a village boutique. Lower right, St. Salaun at Folgoet.

Supersensitive Film for Amateurs

Eastman Kodak Company Announces New Fast Panchromatic Safety Stock for 16 mm. Cameras

ONE of the most important announcements that has ever been made in the 16 millimeter motion picture field is the news from the Eastman Kodak Company that the new supersensitive panchromatic film is now available for use in the 16 mm. cameras.

This remarkable new film puts an entirely new aspect on the subject of personal movies. The extreme speed and high degree of color sensitivity of supersensitive film batters down many of the photographic barriers of the past. Motion pictures can now be made of subjects that could not be photographed satisfactorily before.

The following is taken from the manufacturer's announcement and gives details of interest:

"Pronounced sensitivity at the red end of the spectrum makes the emulsion of this film particularly efficient when exposed to rays of artificial light—especially light of incandescent lamps. As a result, the range of cine activities is signally extended.

"With supersensitive panchromatic film, it is now possible—in fact, easy—for amateurs to photograph subjects indoor by the light of ordinary electric lights. No longer is it necessary to use expensive lighting equipment to obtain indoor movies.

"To say the least, the imagination is taxed in attempting to conceive of all the numerous new channels of interesting movie making that are now open. As a striking example, your living room can be quickly transformed into a temporary studio simply by placing two or more 100-watt bulbs in as many reading lamps. With your lens set at f.1.9, you are all ready for first-rate home movie portraits; close-ups of the children; or numerous interesting subjects that do not require the source of illumination to be more than a few feet away.

"Lighting effects that are different—and beautiful—can easily be obtained by placing additional lights at the sides of and behind the subject. One lighted bridge lamp set behind the subject produces a "back lighting" which gives a pleasing depth and roundness to the picture. See Fig. 1. It should be understood that the **direct** rays of artificial lights should not be allowed to enter the lens. Lighted floor lamps and table lamps can be included in the picture, and will not cause fog or halation if the bulbs do not show through or under the shades. It must be remembered, however, that brilliant pictures can only be made when there are additional lights (out of range of the camera) for direct illumination.

"By increasing the number of electric bulbs, the camera can be placed farther from the subject thereby increasing the scope of the picture. For instance, in Fig. 2 the camera was twenty-one feet from the group. The diaphragm opening was f.1.9, and six 100-watt lamps were supplemented by two 60-watt bulbs placed in a reading lamp.

"An exposure table for Cine-Kodak supersensitive panchromatic film when it is exposed under artificial light conditions is given:

Exposures Table
for Cine-Kodak Supersensitive
Panchromatic Film

These exposures are for the Cine-Kodak operated at normal speed. Halve the illumination at **half-speed.**

Distance from Lamps to Subject	Diaphragm Opening	Total Wattage of Lamps
2 feet	f.1.9	200
2 feet	f.2.8	300
2 feet	f.3.5	400
3 feet	f.1.9	300
3 feet	f.2.8	450
3 feet	f.3.5	600
5 feet	f.1.9	600
7 feet	f.1.9	800
9 feet	f.1.9	1200

"Best lighting is obtained by arranging the lamps on each side of the camera, so that both sides of the subject are illuminated. It is advisable to place the lights at different distances from the subject. For example, the above table gives an exposure with the lamps 3 feet from the subject; the lamps can be placed 2½ and 3½ feet from the subject. Be sure that the camera is in a position so that the lights used for direct illumination will not show in the finder.

(Continued on Page 43)

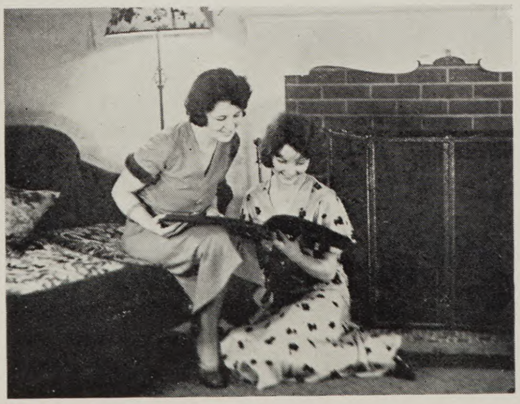


Fig. 1

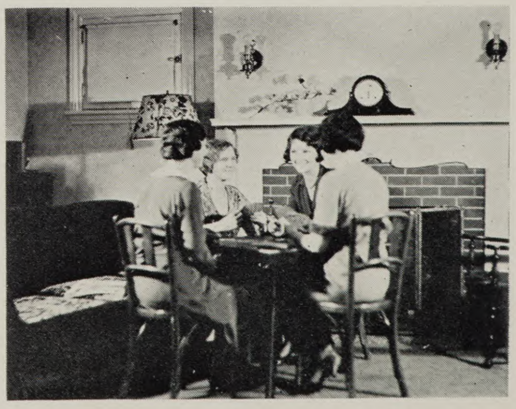


Fig. 2

Photographs by the Author

CAMERA STUDIES IN THE ARIZONA DESERT

by HATTO TAPPENBECK, A. S. C.

SPEEDING through the white sandhills near Yuma the heat increased to a terrific degree as we were nearing rapidly the Arizona border line. The few tiny white clouds over the western horizon, which had accompanied us thus far, evaporated like the steam from a tea kettle. Our thoughts went back with regret to the crisp breeze of the blue Pacific we had left behind us this very morning.

Hours later—the border hundreds of miles behind—there was a pleasant surprise in store for us. We had passed Phoenix and were now steadily climbing up the trail which leads into the land of the Apache Indians, where once their famous chief Geronimo reigned supreme; three thousand to four thousand feet altitude.

The heat decreased as we went up and above our heads small white clouds formed apparently out of nothing. Racing along the azure blue sky they grew into enormous size, but when they reached a certain spot above the middle of the desert the rising currents of hot air tossed them around and played with them till they had vanished as quickly as they were born.

The air four thousand feet up was cool and pure. Foliage trees crowded out the desert bushes and cacti of the lower regions. Soon we descended again to the latter. The air became filled with the smoke of the copper smelters, which with the gasoline stations and stores along the road form the only sign of white men.

Presently we left them behind and entered the Apache territory, where these former Indian warriors now follow peaceful and domestic occupations. They live in small round huts, not unlike a bee-hive with canvas covering on top. They resent intruding and avoid being photographed as much as possible, unless a generous tip changes their mind.

Here, away from civilization is the very paradise for the pictorialist during May and June, the time when the Arizona desert is in bloom! What a contrast with two months ago! Then the rain produced only a few tiny green leaves or sprouts on the end of the dried-up bushes and shrubs. Now everything is covered with new fresh growth. The reddish ground and rocks, undoubtedly of volcanic origin, are nearly hidden by an elaborate cloak of green and yellow. The latter color is quite predominating. However, nature seems to balance and blend the whole into a perfect painting, suitable for color photography, black and white, or actual subject on canvas as well. The colors are there, mostly in delicate pastel shades.

Green bushes have yellow blossoms, yellow shrubs are covered with white buds. The Giant or Sahuaro Cactus bear flowers like short-stemmed daisies, white petals with yellow centers, which open up by the dozen at the time and form a wreath or crown around the top of each of the arms which these Giants stretch towards heaven.

The smaller varieties of cacti, Choalla, Prickly Pear, etc., have blossoms and fruit of every tint of yellow, orange and red. The white high stemmed Yuccas can be found in the plains as well as on the slopes of the hills, and the roads are bordered by red, white and purple species of the thistle family. The ground in between is covered with wild flowers and thorny, low shrubs of wide variety, mostly colored from orange-red to magenta and purple. These shades seem to offer the greatest attraction to small insects.

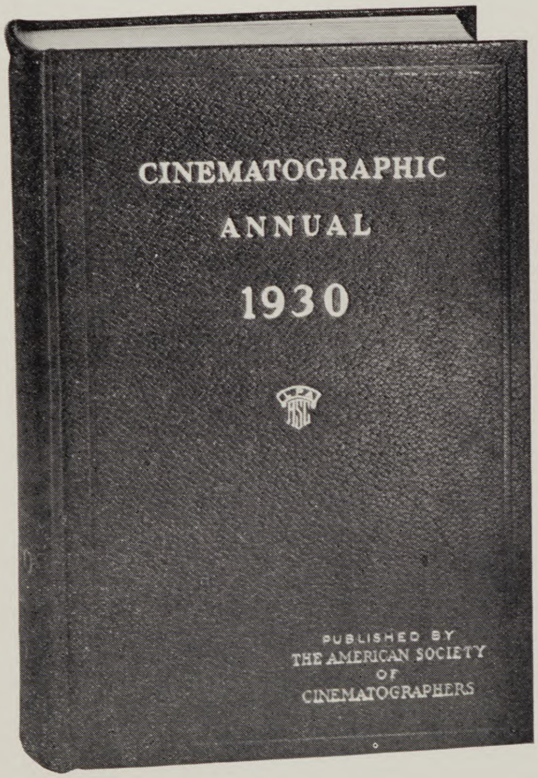
To the close observer the desert reveals also a large number of interesting animals. Birds, chipmonks, lizzards of every description and color may readily be noticed on and off the

(Continued on Page 41)

The Last Word

for Professionals or Amateurs..*the*

CINEMATOGRAPHIC ANNUAL



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Hollywood, California

Babbling About Brittany

(Continued from Page 34)

days, it gave me a sensation of unreality when I left the hotel on my first morning and saw these flocks of story book children looking as though they had come down from the wall paper of a modern child's nursery, Little Miss Muffit, Jack Horner, Augustus, Red Riding Hood, Contrary Mary, and all the other delightful unreal children we have ever known.

That is one of the charms of this Brittany, every village has a slightly different aspect, different cap, and different ways. Here is something in petticoats I did not see elsewhere. The grown-ups also wear very bright and embroidered clothes, and a multiciplicity of petticoats, one over the other, and each one a different color!! This gives a lovely rainbow effect when they dance, and the skirts switch out, and pink, and blue, and yellow, and red, and green petticoats go swirling round too. It is a great sight on Sunday to watch from below the flight of step the "sortie de la grand'messe" men, women and children all in the velvets and embroidery, and these rainbow petticoats flashing and disappearing as they come down the steps to the road.

The idea behind this petticoat wearing is two fold. Either it is to display wealth, you have money enough to own all these, or to indicate coquettishness, and the difference in color is to make the counting of the number easy. I noticed one pretty girl with a great display. I counted up to six, but I had difficulty in understanding whether she wished to convey a flirtatious invitation or merely exhibit her financial stability. I could not determine whether she wished to flaunt her wealth or her charms at me. Too faint hearted to "take a chance" and risk a snubbing, I shall never know now—for if ever I return she will be a grand mother.

February is the great marrying month and it is not an uncommon sight to see a dozen couples at the church being married en bloc.

It is a short distance to Le Folgoet where you will find one of the altars built in the open air, on the village green, or in an enclosed garden, and here when the day is fine the great religious ceremonies will be held instead of inside the church. In no place in the whole world are there so many churches as in Brittany, perfectly gorgeous cathedral-like buildings set at times in places where only about four houses are, and so far off the tourist beaten track that they are literally "born to blush unseen" and their architectural beauties can never be properly appreciated. Here in Le Folgoet is a splendid church built in memory of an idiot. I have found more than once that a local saint or venerated person has been a half-wit, or a person having some personal peculiarity for which, feared or despised during life, after death he had become beatified.

This particular idiot named Salaun, lived under a large tree, close to a fountain, spending his time decorating the altar of the Virgin with lilies, and eternally singing: "Ave Maria! Ave Maria!"

This evidently annoyed certain villagers so they "took him for a ride" and left him in the depths of the forest, having previously spread an easily believed rumor that he was possessed by an evil spirit. The Priest finding this out went in search of him, only to find him dead. Bringing him back to the village he caused him to be buried near his tree and fountain, when to the amazement of all a great white lily grew on his grave, which, upon investigation proved to have its roots in his mouth, and more miraculous still, upon the great white cup of the flower, in letters of pure gold, was written, clear to be seen by all, the words which had become so irritating by repetition in life: "Ave Maria."

Crowds would then gather round his grave and retell the story. A new and better church had long seemed desirable to the Priest. Here was an auspicious moment to gather the funds. So in expiation of their cruel conduct he induced them to build this fine "Notre dame de Folgoet," the name Folgoet is a modern corruption of "Notre Dame de Fou du Bois" ("Our Lady of the Fool in the Woods") and from the eastern outer wall there still gushes the water of his fountain of pure drinking water, and on the right hand side of the porch of the church entrance you will see his statue, with his tree in his hand, an angel perched on his back, and, at his feet, a representation of his spring with fishes swimming in the waters of the pool. And do look at the haughty disdainful supercilious stare he gives every villager who enters that door, as though to say: "Who's looney now?"

◆

Eastman Gray Base

(Continued on Page 15)

way. For many years the Research Laboratories of the Eastman Kodak Company have been experimenting with backings, as a result of which they have evolved a special light gray backing which can be applied to negative film and which, in conjunction with the double coated film, obviates halation completely.

For motion picture work a gray base is now being used as the support for all Eastman Super-sensitive Type Two Panchromatic film. This gray base does not change during processing and so involves no danger of chemical trouble.

It is of importance to note that anti-halation backings have no direct chemical effect upon the emulsion characteristics. However, there is a decided enhancement of photographic quality effected by the avoidance of scattered light from the base side of the film. The removal of scattered light, then, gives the effect of different emulsion characteristics, although this effect is arrived at indirectly and not as an alteration of the emulsion.

From a technical standpoint, the only difference in handling procedure demanded by gray back film is a consideration of the gray base density, which amounts to approximately .20 (63%T) in measured density after developing, fixing, washing, etc. The sensitometric difference is very slight, amounting only to a displacement to the left of the H and D curve, as compared with a similar test on white base. Figure I shows for the same emulsion, coated on gray base and white base, the actual sensitometric difference. As a result of this base density an increase of approximately 1½ to 2 printer points is necessary. This difference is very slight and causes no difficulties in laboratory procedure.

A practical example of the value of the anti-halation backing is shown in the two accompanying photographs. Figure 2 shows a scene photographed on a negative emulsion coated on a normal white base. Figure 3 shows the same scene photographed with the same camera under identical conditions on gray base film. The films were developed together in a single solution for the same time. An examination of the prints will tell better than words the effect produced by the gray base anti-halation film.

Actual tests by motion pictures shows a marked improvement in sharpness, highlight detail, and an overall enhanced photographic quality. The effects of halation are far reaching and the use of a film which destroys these effects should be in immediate demand.

◆

33 Percent of Gross Now From Foreign Field

FOREIGN accounts now make up 33 percent of Fox's gross film rentals, says Harley L. Clarke in the company's annual report. Increase in number of wired houses abroad promises a continued expansion of this market, said Clarke.

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New B. & H. Printer

(Continued from Page 28)

The machine cannot function if any of its parts are not in perfect order. The accidental "burning out" of a lamp, breakage of film, or any error in threading will lock the machine or stop it automatically, if the accident occurs while the machine is operating.

The automatic functioning of the machine, including the positive and instantaneous change of printing light, insures elimination of waste, a fact which will be appreciated by laboratory experts.

The film "light changes travelling mattes" are prepared before hand and kept in stock for any length desired. An attachment which fits the Bell & Howell splicing machine has been developed which enables the operator automatically to match the film mattes for the length of each scene of the negative with utmost ease and certainty.

The new Bell & Howell printer introduces many new conceptions of printing practice and leads the way to a standardization of printing quality which will be appreciated not only by producers and technicians of the Motion Picture Industry, but also by the public at large.

Fast Improvements

(Continued from Page 10)

ing face and skin texture more natural, particularly in close-ups, the use of "Daylight" blue globes in part of the floor lamps was effective. They whiten the light somewhat and make the use of the extra dark make-up unnecessary. At the present time the soft glass of these blue globes does not stand up under studio use as they bulge and burst with continued burning in the enclosed lamp housings used on the set. This has prevented their more general use, and it is hoped the glass and lamp manufacturers will discover a better way to make this product.

While the emulsions have been improved in many ways, still there was an untrue rendering of extremely bright highlights and deep shadows. Brilliant light sources became blurred by halation to the extent of losing definition. White starched shirts, for example, became dazzingly white on the screen unless they have been dyed a soft tint to prevent the excessive halation. Light fixtures were stippled or diffused, and highly reflective objects such as beveled mirrors, automobile wind shields, cap visors and such has to be putty-ied down to prevent distracting flare. This fault became even more apparent with the super-sensitive film, so the manufacturers next set about to overcome this. The resultant latest offering is the Super-Sensitive Anti-Halation Film, or, as studio parlance has so soon named it "Greyback" film. The latter name is derived from the appearance of the film, for the super-sensitive emulsion is coated upon a celluloid base that contains a small amount of lavender-grey dye. This dye has the property of absorbing the light that has traversed the emulsion at those portions where the image of an extremely bright object is focused upon it. The light would ordinarily reflect from the surface of the celluloid support, back into the emulsion and further diffuse, causing a halo or flare of light in the area surrounding the bright spots.

Scenes and tests that have been made with the Anti-Halation film are amazing. No longer are we afraid to shoot into the bare filaments of an ordinary light bulb, and the night-mare of the extreme contrast of formal clothes is gone. Cutglass and diamonds are not blocked up with halation, and photograph like the real thing instead of the 5 and 10 cent store variety. Bright lustre paints of settings will now be possible. Silhouettes against the sun or reflections of water do not have the unnatural flare that destroys definition, and light effects take on a new scope of possibility.

The accompanying illustrations show the remarkable advantage of the anti-halation film. The regular supersensitive stock was used, then the "grey-back." Enlargements were made from that portion of the scene where the actor is directly in front of the bright lantern. The old film shows considerable halo of the bright light, and the features of the man are blurred. The anti-halation renders more natural definition, in this respect. It is admitted that this is an extreme example, but the results of ordinary light conditions are so much superior to the old film that this new type of film is now being used on several productions and will soon, I believe, be used exclusively. Both the Eastman and the Dupont film companies are to be congratulated on their accomplishment.

In laboratory practice the slight increase of the density of the negative, due to the dye in the base, is corrected in printing, being about 2 points increase in printing time. No correction was made in preparing the prints for the illustrations shown, and they convey an idea of the slight difference of density of the two films. On the screen the new film gives the effect of being softer in quality, having more detail in the shadows. This is partly due, perhaps, to the fact that the scene may be printed a bit lighter because there are no glaring highlights to try to print down. While this film corrects flare and diffused images of highlights, still this effect is quite different than that diffusion obtained with "Diffusion discs and screens," so that these may be employed as before.

Camera Studies

(Continued from Page 37)

beaten paths, while the coyotes and other larger animals hide during the daytime, but try to keep one awake at night.

High volcanic peaks and jagged rock formations, displaying various tints of red, brown, and purple, surround the lower plains of this desert country and create the impression that one is in the crater of an enormous extinct volcano. Dry river beds cut deep into the surface, and in the distance the wide, but shallow Salt River rushes its swift waters towards the West. There are several extensive lakes hidden in these mountains. Their placid indigo-blue waters reflect a perfect image of the surrounding landscape and the everchanging sky above.

Whoever thinks that only a blue heaven and fleecy white clouds can be found in Arizona at this time of the year, is mistaken. True enough, it is often real hot in the desert under the merciless sun rays, but before the day is over an entire change may have taken place. The sun may be wholly obscured by heavy clouds during the afternoon, only to burst through them again at the end of the day into one of the most gorgeous and colorful sunsets you ever saw.

One never knows what the weather has in store out here. The next morning may not reveal a single cloud, but towards noon the sky is already covered with them, leaving big patches of blue in between. Then, while you are waiting for a sunset, the clouds get heavier and menacing. Suddenly a flash of lightning, a warning from the Gods to men and beasts to seek shelter; and before the thunder-noise has ceased hail stones begin to fall all around, only to be followed a few minutes later by rain drops of equally enormous size.

Wet to the skin we hurried with our cameras to the camp from which we emerged an hour later again on our quest for the majestic fadeout of the setting sun. However, thunder storms were raging all around us, and lightning was flashing in all directions. A beautiful spectacle which lasted for hours!

The sunset was drawing close but drowned totally in the rainswalls on the western horizon. There we could see the rain pouring from the sky. Flash after flash split the approaching clouds. We counted at least a dozen separate storms along the surrounding mountains. From all sides they seemed to rush in on us. We tried to catch the chain-lightnings (as they went down) in our cameras. Nearer and nearer they came till the flash and the thunder appeared to be simultaneous. The first drops fell and urged us to leave the mesa for our safer camping ground. None too soon we arrived there; just in time to save our film and belongings from the deluge by the cloudburst. The downpour lasted several hours, and cooled off the atmosphere and refreshed the soil!

Brighter than ever the sun rose the next morning, brighter looked the earth; and the pure air filled with fragrance from the desert plants was a tonic for the system and a revelation of nature.

●

Filmo Topics

AMATEUR movie makers will find much of interest in the July issue of Bell & Howell's interesting little magazine, Filmo Topics. This will be mailed free if you write to the Bell & Howell Company, 1843 Larchmont Ave., Chicago.

The contents for July follow:

On the Tyranny of One's Elders—The story of an infant's revenge.

Plots for Child Movies—Some ideas which will help you turn out films of the youngsters which everyone will enjoy.

When, Why, and How to Use Color Filters.

Filmo News Pictorial.

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New British 3-Color Process

A NEW British three-color process, known as the Spicer-Dufay system, was demonstrated recently at the Royal Society headquarters in London. Pictures taken by this process may be photographed in the ordinary way, without special apparatus, and projected over all standard equipments, it is claimed. Cost of the color film, it is said, will be slightly higher than black and white.

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In the manufacture of Goerz Cine Lenses, conscientious and intelligent application is displayed in each successive process—from the careful selection of the optical glass used to the last ultimate polish and adjustments of the lens elements.

A new catalog (AC6) listing the complete line of Goerz Lenses and accessories will be mailed on request.

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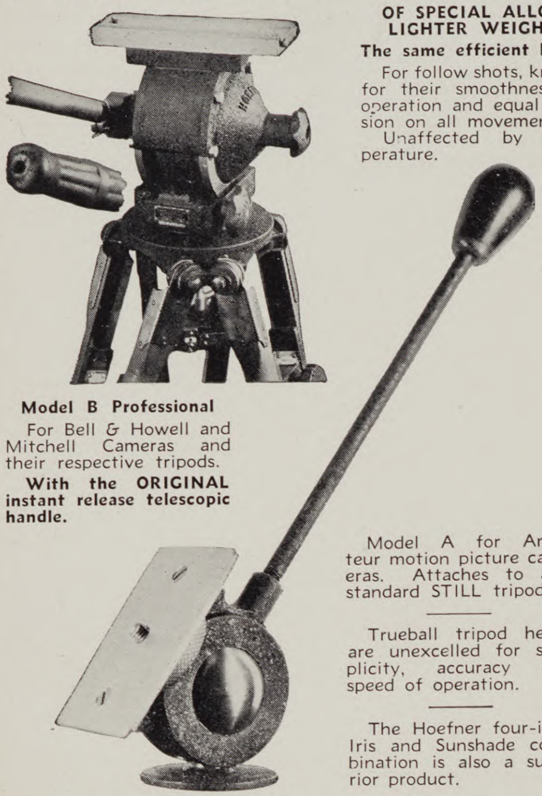

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The Leica Invades the Studios

(Continued from Page 16)

the actual filming of the scenes. It is noiseless and does not interfere with the sound, nor with the cameramen and director. Thus unusual action stills may be secured with a depth and a brilliance as never before. They will boost the sale of the picture to the exhibitor. Hundreds of stills may be taken and the best ones selected for reproduction. The enlargements of Leica negatives up to 8x10 or larger without showing of the grain is made possible through the use of a borax developer for the duplicating positive as well as for the enlarged negative. Such a developer is now generally found in the modern laboratory.

Besides the saving of time, lights, production cost, overhead, etc., the actual elimination of the 8x10 still plates is a negligible item. It is up to the individual stillman to take advantage of the possibilities which the Leica camera offers: Camera angles, situations, fast action, better close-ups which cannot be duplicated, valuable publicity stills, etc. He should be the first one to overcome the old traditions of the direct contact negative and should make suggestions to the studio officials and convince them of the superior results obtainable with the small cameras.

On location the Leica camera with a wide-angle lens is ideal for pictorial work; in fact it is suitable for almost anybody who has real interest in the art of photography. Many of the best pictorials and portraits now exhibited at the photographic salons all over the world have been made with the small cameras.

And the motion picture cameraman is not excluded. Many have already made the Leica part of their standard equipment. For experimental purposes it is unsurpassed, because it allows the cameraman to duplicate the actual shooting conditions. Locations may be photographed with it in advance with the same film, the same filters, etc., as used later on with the motion picture camera. The Leica keeps the cameraman up to date with the rapid changes in the film industry. It serves as an accurate and inexpensive means of testing new film emulsions, filters, combinations, diffusion disks, and gives at the same time a novel and pleasant angle to the photographic work. The whole camera outfit, as well as the enlarger, are so compact that they hardly take up any space in the home or garage.

During the past two or three years the world has become quite color minded. The three or four color processes using separation negatives may be handled with the Leica camera. However, this will not be of as much value to the color cameraman, as the fact that he may obtain accurate data and comparative tests with this camera for emulsions and filters now in use with various color concerns in the industry.

attention

The pictorial section of the next volume of the Cinematographic Annual is being compiled. Anyone wishing to contribute prints for this section may send them in now for consideration.

Supersensitive Film for 16 mm.

(Continued from Page 36)

"One of the largest fields of picture activities opened by the new 'pan' film is that of indoor sports—basketball games played in well lighted gymnasiums, indoor track events. Other athletic events taking place on well lighted platforms can be easily photographed when stop f.1.9 is used. If the illumination is exceptionally good, even smaller lens openings can be employed.

"The increased range of picture taking provided by the new supersensitive panchromatic film actually embraces night scenes on brilliantly lighted streets, or theatre districts in large cities. For pictures of this kind the camera must be fitted with an f.1.9 lens and the largest stop (f.1.9) must be used. Best results will be obtained after a rain. The glazed surfaces of the street and the sidewalks will then reflect the rays of the hundreds of lights, giving added illumination and unusual effects. If the lights are very brilliant, the camera can be used at normal speed. Half-speed gives twice the exposure and generally produces more brilliant pictures. It should be kept in mind, however, that the action of moving vehicles and people walking on the sidewalks will be twice as fast. That is not so objectionable in the case of automobiles or street cars, because they then only appear to move more rapidly, but the action of people walking will be jerky.

"Animated electric signs usually make fascinating pictures. Action often found in the windows of large stores sometimes affords an attractive night subject.

"Fireworks, flood-lighted buildings, camp fire scenes, are all now within the scope of night movie making.

"The remarkable qualities of Cine-Kodak supersensitive panchromatic film are valuable for daylight photography as well as for pictures at night. The increased light-sensitivity of the film is not confined altogether to the red end of the spectrum. It is nearly twice as fast to blue and ultra-violet light as regular panchromatic film, permitting successful pictures to be made under very adverse weather conditions. Unique shots can be made during a downpour of rain with supersensitive film, and the cine camera now becomes an efficient instrument during the early hours of the morning or in the weak light of the afternoon.

"Cine-Kodak supersensitive safety film makes the 'photographic day' twenty-four hours long."

Television to Spend $250,000,000 On Output

CONFIDENT that general business conditions will improve soon, production plans have been made for $250,000,000 worth of television broadcast sound receivers and accessories, said B. P. Geddes, executive vice-president of the Radio Manufacturers' Ass'n, at the convention held in Chicago recently.

Issues Lighting Catalogue

A 100-page catalogue on electrical lighting equipment for theatres, giving complete specifications with illustrations in colors, has been issued by the Major Equipment Co., Chicago. Reflectors for all uses, stage lighting products, both permanent and portable, window lighting, flood lighting and cove lighting are among the subjects treated.

Stills From Action Scenes Possible With New Camera

A NUMBER of Hollywood studios are now using a new type still camera which makes pictures from action scenes. Backers of the project are said to include Mervyn LeRoy, Louis J. Selznick, John McCormick and William K. Howard. The camera is also being sold on a royalty basis to photographers outside of the film industry.

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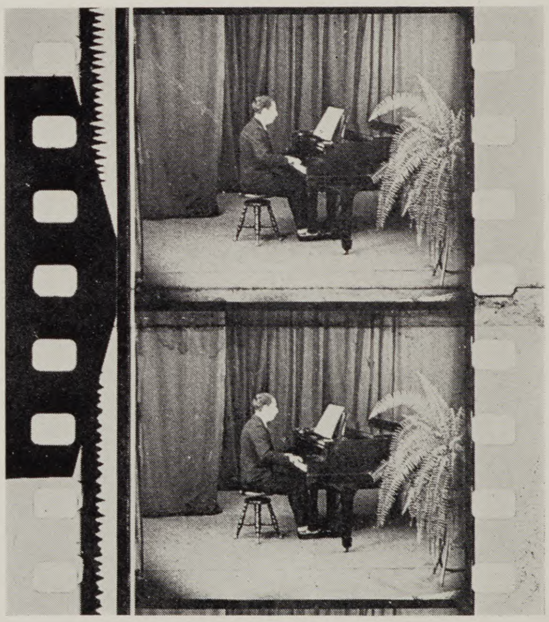
New Splicing System for Sound Track

AN improved system of treating the sound track at splices—a system eliminating messy methods of painting and at the same time successfully silencing splice noise—has come out of the Eastman Kodak Research Laboratories and onto the market. The new method was described to the industry more than a year ago, but production of the necessary "blooper patches" and the simple block for applying them has only recently made it applicable in processing laboratories and projection rooms.

The introduction of this equipment came as a result of many requests that followed the announcement of the new patching process. The wide interest shown indicated to the Kodak Company that expenditures involved in acquiring tools to make the patchers and the patches would be justified.

The patching system obviates a condition in which imperfect painting of the sound track at splices frequently caused noises as objectionable as the extraneous sounds made by the reproducing system when an untreated patch went through. The older method caused more dissatisfaction in projection rooms than in laboratories, where skilled workers painting the sound track at hundreds of splices a day attained proficiency in the process. Even in the laboratories, however, it is believed that greater speed, together with assured accuracy, can be gained by use of the new patching process.

In seeking a solution to the problem, the Eastman Kodak Research Laboratories first tried gummed paper, then decalcomania transfers, and then an opaque film material; but none of these materials for patches proved entirely satisfactory.



An Example of the New Patch

The material finally adopted was a very thin clear film base, coated with an emulsion and exposed and developed to produce opacity. The patches are five perforations long and they are cut in a shape designed to cover the sound track completely for a distance equal to the width of a standard splice but tapering away toward each extremity until the sound track is entirely exposed. When a properly mounted patch passes through the reproducer the light reaching the photo-electric cell from the sound record is reduced gradually to an insignificant intensity and so continues until the splice has passed, after which the light passing through the sound record gradually attains its original intensity. The resulting diminution of sound lasts not long enough to be perceptible.

Hold It!

President McNabb of the Bell & Howell Company makes personal movies of the captain of the Leviathan as he leaves on a European trip. Of course, it is a Filmo.

Industrial Color Rights Acquired by M. P. Machines

EXCLUSIVE industrial color rights to the Panachrome color process for the U. S. and Canada have been acquired by Motion Picture Machines Co. of Pittsburgh, it is announced by A. S. Isaacs of the latter company. Panachrome is a four-color additive method, requiring a change of a lens in the camera and in the projector. The stock is regular black and white film and can be processed in any labaratory in the usual way. Any camera and any projector may be used with no more trouble than is required in changing from one focal length lens to another in either camera or projector, it is stated.

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(Continued from Page 30)

dramatize the holiday so that the film will be of lasting interest to all of the participants? If you follow the first two methods, you can safely follow the news-man's method, and shoot things as they happen. If you prefer the latter type of picture, you will have to stage most of the action. For this, you will want some prearranged plan: not necessarily a script, but at least some notes on what to get, leaving the actual method to your ingenuity at the moment.

If on the other hand, you do not care for the record film, but want to make a real dramatic picture, you will want a definite, carefully prepared script. In it you will not only indicate what scenes are to be shot, but just how they are to be photographed and directed, in considerable detail. Furthermore, if you attempt serious dramatic filming, you must make it a collective proposition; you positively cannot attempt to do it all yourself. You must have the enthusiastic cooperation of a group, some of whom will act, some of whom will assist in costuming, set-building, location-picking, property-handling, transportation, scenario-writing, script-clerking, and all the many other details which must be perfectly attended to. Most important of all, you should have someone who will take the responsibilities of directing the action off your shoulders, for if you are to photograph the picture properly, you cannot attempt to carry two jobs on one pair of shoulders. But with such a group, with the responsibilities properly divided, you can have more pleasure, and gain more valuable experience than you could in months of independent filming. Try it!

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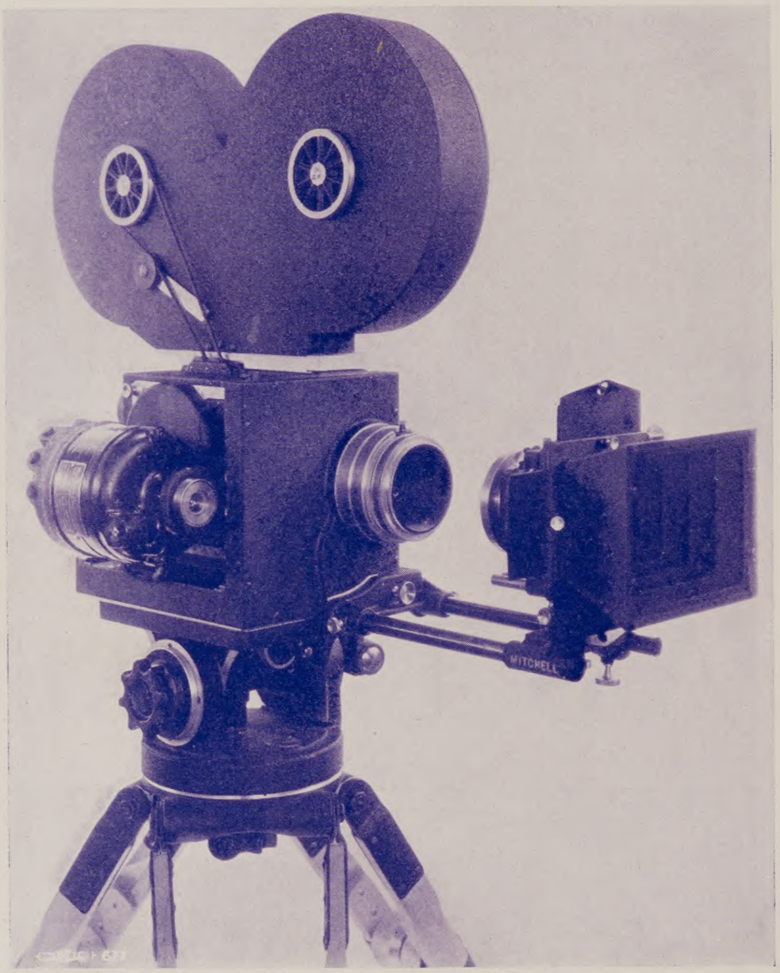

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